# Chapter 3 Affected Environment

## Introduction

This chapter describes past, present, and reasonably foreseeable actions as well as the affected environments of area resources.

### Past, Present, and Reasonably Foreseeable Actions

Past actions in the Kahler Creek area have been primarily timber harvest operations. District timber harvest records indicate past harvest in the Kahler planning area between 1940 and 2009 totaling approximately 26,000 acres. Most of the acres harvested (approximately 22,000 acres) involved single tree selection cuts or partial removals, where individual trees or clumps of trees, generally large-diameter ponderosa pines and Douglas-firs, were removed.

Present (ongoing) actions were considered when evaluating cumulative effects. Two present actions could potentially affect forest vegetation conditions in the Kahler planning area: (1) a District-wide noncommercial thinning project authorized by categorical exclusion (CE) (Decision Memo) in 2009, and (2) the Long Prairie Fuels Reduction project, which was also authorized by Decision Memo in 2009. Both of the ongoing actions involve noncommercial thinning activities designed to increase residual tree vigor, address dwarf-mistletoe and other insect or disease issues, and reduce ladder fuels. The cumulative effects analysis also explicitly considers direct and indirect effects expected from implementation of activities included in Kahler alternatives 2 or 3. The noncommercial thinning and prescribed fire treatments authorized by CE represent incremental actions that are fully responsive to the Kahler project's purpose and need.

Future actions are considered to be reasonably foreseeable if Forest Service planning activities (scoping, etc.) have been initiated for them. Based on a review of the Forest's Schedule of Proposed Actions (SOPA), no reasonably foreseeable actions potentially affecting vegetation conditions in the Kahler planning area are anticipated over the next 5 years.

## Soils

#### Methodology

For a complete description of the methodology used for the soils analysis, please see the Soils report, page 2.

#### Affected Environment

##### Natural development

Within the project, four soil orders are identified by the soils mapped in proposed units. The soil orders within the project area range from slight (Inceptisols & Andisols) to intermediate (Alfisols and Mollisols) in their degree of development (Brady & Weil. 1999). For context, soil development can range from hundreds of years to thousands depending upon the competency of the parent material and the climate of the area.

Soil taxonomy offers a window into how the landscape may have looked long ago. For example three of the four soil orders identified can develop under a forested environment. Inceptisols

(~1% of unit soils) are recently developed soils (Brady & Weil. 1999), and may form on the deposition of colluvium (rock fall). The series within the soil order of Inceptisols are mapped mostly in draws and other concave landforms and thus conform to the concept of Inceptisols development. Andisols (~6% of unit soils) are formed when there is a deposition of volcanic flow of pumice material or the deposition laden with ash and pumice, such as those found within the Kahler area. In the Kahler area it is assumed that the presence of intact over burden of ash air fall is a sign of increased productivity (Garrison-Johnston et al, 2007), when compared to non-Andic soils. Alfisols are soils associated with development under forested conditions (Brady & Weil. 1999). It should be noted that the presence of Alfisols are not part of the taxonomic description of any of the dominant soil series in the mapped complexes. The implication of this finding is Alfisols (forest developed soil) played a minor role in the forest we see today.

Then there is the soil order with the largest acreage within the project area, Mollisols (~96% of unit soils). Mollisols typically form in a grassland environment; some Mollisols form under forest, but mostly in depressions (Brady & Weil. 1999). What classifies these soils as Mollisol; a dark color (Chroma of 2 or less), the presence of high organic matter content, and >50% saturation with base-forming cations $Ca^{2+}$, $Mg^{2+}$, etc. (Brady & Weil. 1999). Given the prominent expanse of the Mollisols soils mapped in the area, it is not likely these soils formed under a forest in topographic depressions. Not that trees were absent in the development of these soils; but the soil habitat may have been best described as savannah with widely spaced trees. It is not known what may have created the conditions which formed these soils, but it is very likely that fire had a role in density management that produced the areas Mollisols.

W15 = weight percentage of water retained at 15-bar tension
Db1/3 = bulk density of <2-mm fabric at 1/3-bar tension
Cm = rock fragment conversion factor derived from: volume moist <2-mm fabric (cm3)/volume moist whole soil (cm3)

### Human Influences to the Soil Resource

As mentioned in Methodology (Field Observations), there have been human caused influences that caused some change to the soil resource. Some of these influences have been recognized as having either beneficial, no effect, or detrimental effects to the soil resource.

In the past, human ignited fire could be partially responsible for stand densities consistent with Mollisol soil development. In a general sense, it is assumed that maintenance burning will beneficially consume fuels, preventing the high intensity/long duration fire that can detrimentally heat alter the soil resource. Conversely, current human suppression of fire helps to build wildland fuel loads that may create detrimental effects to the soil resource (i.e. heat altered soil). Heat altered soil is commonly associated with sterilization of the topsoil and the formation of hydrophobic layers that promote erosion and stream sediment.

The most direct and recognizable influence left on the landscape is either from past harvest activity or unregulated recreation activities (see Soils Report Figure 1, page 4). It has been noted by numerous authors that compaction and displacement effects associated with temporary roads and skid trail equipment traffic can detrimentally influence vegetation and their associated soil communities (Froehlich & McNabb1983, Amaranthus et al, 1996, Bulmer et al, 2010 and Miller 2004). Often, impacts like temporary roads landings & trails do not prevent vegetation from growing seedlings, but these features can limit the opportunity of vegetation to reach maturity. Additionally if left on the landscape without Effective Ground Cover (EGC) these features can cause erosion (Lane et. al. 1988). Depending upon the impacts proximity to surface water, they

could serve as sediment sources. At this time there are no observed sources of direct sediment input within the project area.

### *Erosion and Sediment*

Baseline overland erosion and the sediment it may create were modeled with WEPP, for slopes and soil textures found within proposed harvest units. This modeling also took into account the differing soil textures & rock percent's associated dominant soils in all units; unit slopes ranges, and the EGC were also part of the variables in the modeling. To generate baseline sediment and the probability of its occurrence, the range of variables in units were populated in the model to test the greatest distance offered within the model (1200ft). This modeling showed a baseline that was low probability (0%) of sediment and low volumes of sediment (undetectable). Since this is a model and may not represent actual occurrences, the nearby Barometer Watershed report (Harris, et.al. 2007) was used to define a baseline estimates to be used with the modeled results for sediment; this soils analysis assumes that modeled estimates above 0.03t/ac will need some mitigation or avoidance measures to allow for proposed activates to be considered sustainable from the perspective of the soil resource.

**Table 3-1 Resource Indicators and Measures for the existing condition**

| Resource Element | Resource Indicator | Measure | Existing Detrimental Soil Condition (ac) |
|---|---|---|---|
| 1) Soil Stability | Soil Mass Wasting | No active areas identified | 0.0 |
| 2) Soil Productivity | Erosion | Activity unit acres modeled >0.03t/ac | 0.0 |
| 3) Water quality | Sediment | Activity units that may produce >0.03t/ac | 0.0 |
| 4) Detrimental Soil Conditions (DSC) | Change or absence in vegetation growth | Legacy trails in project area (Est 152.8 total miles)[1] | 45 |
| | | Legacy trails in proposed Harvest Units (Est 45.1 total miles)[1] | 13 |
| | | Legacy trails or landings in RHCA of either class 2, 3, or 4 streams (Est 19.4 total miles)[1] | 6 |

### Resource Indicator or Measure 1

Observations were made early in the project for soil stability and field examinations for these features do not conflict with completed soil mapping (Terrestrial Ecosystem Unit Inventory) and or add to known landslide features mapped on the Umatilla NF. Therefore this resource indicator of slope stability is not a factor in this analysis.

[1] This estimate of DSC is based on Kahler field observations. Of the 98,200 feet of examined trails; 31% was considered to be in DSC.

### Resource Indicator and Measure 2

Presence of erosion was detectable, but field observations are consistent with expected sedimentation rates noted by WEPP and Harris, et.al. 2007.

### Resource Indicator and Measure 3

Evidence of scour (sediment movement was recorded in the examination of streams (i.e. Class 4 identification). However it is assumed that field observations are consistent with expected sedimentation rates noted by WEPP and Harris, et.al. 2007.

### Resource Indicator and Measure 4

The presence of DSC was found in association with legacy trails. It is assumed that most of these trails were left from previous harvest activities, but some may have been created from unregulated recreation in the area. Topography of the area is conducive to access for most forms of vehicles used in recreation activities. Estimates of DSC are based on the 2013 Kahler field observations; in those site visits 98200ft of trails were examined; 31% was considered to be in DSC, when using the criteria from Page-Dumroese, et al (2009).

# Hydrology

## Affected Environment

### *Action Items*

Descriptions of the proposed silvicultural, mechanical fuel, and prescribed burning treatments in the Kahler Project are located in the Forest Vegetation Report, Page 2 and Table 1, and in the Fire and Fuels Report. The treatments which would have a direct effect on riparian areas are described on Page 9 of the Forest Vegetation Report.

These Alternatives (see Alternative Comparison Tables in Chapter 2) propose commercial thinning harvest, non-commercial thinning and possibly biomass harvest, and mechanical fuel treatments in the same units. Harvest systems would be ground based, helicopter, skyline/ground based, skyline/helicopter, and skyline only. All harvest systems would include falling and bunching heavy equipment which would operate outside of heavy equipment exclusion zones along streams. The harvest and possible follow-up mechanical fuel treatments would be done with up to 3 passes of heavy equipment. The potential increase in erosion and sedimentation would be mitigated by several Design Criteria, including WQ10, heavy equipment use will be suspended when the soil is too wet.

The activity fuels in the thinning units would be burned or mechanically treated after harvest. After the activity fuel treatments in units, there would be landscape scale burning. Actions connected to the harvest and burning include log haul on existing roads including those in RHCAs, road maintenance, re-opening, and re-commissioning, new temporary road construction, use of existing skid trails as roads, decommissioning, and closing of open roads. After the harvest activities and prescribed burning, skid trails, landings, and sites with disturbed soil would be treated to reduce erosion and compaction. A subset of temporary roads and trails would be identified for subsoiling and advanced rehabilitation. In addition, this project proposes to retrofit the crossing of Tamarack Creek by Highway 207 to make it more fish friendly. The lower crossing of Tamarack Creek and the crossing of the no-name creek that flows north of Unit 57 by FR 2406 would be improved for the passage of all aquatic organisms. The retrofitting and

passage improvements would be similar to road construction, and the effects would have similar mitigations.

These activities have the potential to impact stream temperatures and canopy, biological criteria, dissolved oxygen, and sedimentation. However, there are limitations on where the treatments would be implemented. There would be no silvicultural treatments or lighting in RHCAs of Class 1, 2, or 3 streams. Because there would be no treatments in these RHCAs, the main effect of the project would be a reduction in the risk of fire spreading into the Class 1, 2, and 3 RHCAs.

The Alternatives propose activities within Class 4 RHCAs. Alternative 2 proposes 682 acres of commercial and/or non-commercial thinning, mechanical fuel treatments, and shrub/steppe treatments in the RHCAs (Forest Vegetation Report, Table 1). Alternative 3 proposes 657 acres of the same treatments. Thinning treatments will use a variable-width, no-mechanical-equipment zone adjacent to the stream channels (see Hydrology Appendix A Prescription). The no-mechanical equipment zone width would vary depending on topography and stream type. Trees within the no-mechanical zone would be cut by heavy equipment from outside the zone, or by hand equipment from inside the zone. Within selected portions of the no mechanical equipment zone, hand thinning of small-diameter trees (those less than or equal to 7 inches in diameter) may occur. Certain trees may be felled along channels and left there to contribute to channel function by providing down wood to retain sediment, expand floodplains, and increase the capacity of the shallow aquifer. The non-commercial thinning would be accomplished by hand methods, and the slash would be lopped and scattered or piled and burned. Commercial sized trees may be cut and felled in skyline units to mitigate for skyline corridors (see Appendix A Prescriptions). Inside the no-mechanical-equipment zone, there would also be lighting of activity fuel and landscape prescribed burning. Within the prisms of existing roads, there would be normal maintenance, brushing, and re-opening activities. The Highway 207 retrofitting and passage improvements would take place within existing road prisms.

Outside the no-mechanical-zone, there would be similar treatments, but they would be mechanized.

The Class 4 intermittent streams dry up between approximately the July and October. For this reason, it is unlikely that the silvicultural treatments and burning would have an effect on stream temperature, biological criteria, or dissolved oxygen, either in the Project Area or downstream. The Project contains BMPs which are designed to prevent impacts to groundwater, springs, wetlands, ponds, stream temperatures, biological criteria, dissolved oxygen, and stream sedimentation.

There would be log hauling on existing roads in all RHCAs. Re-opening closed roads, road maintenance, road reconstruction, Highway 207 retrofitting, and passage improvement projects would cut small trees and shrubs growing in the rights-of-way. This would slow the passive recovery of vegetation in riparian areas. However, the reduction in vegetation is so small that it is unlikely to measurably change the existing canopy cover, which in turn would be unlikely to measurably affect stream temperature, biological criteria, dissolved oxygen, groundwater, or sedimentation.

The commercial and non-commercial thinning, mechanical fuel treatments, and prescribed burning activities are expected to result in a more open canopy with a single stratum of mature trees. Certain BMPs would act to limit the loss of shade, such as WQ-17, Leave all trees on stream banks. However, the reduction in riparian canopy and stream shade is not expected to contribute to stream temperatures during the critical hot weather/low flow period of creeks

downstream of the project area, because the Class 4 intermittent streams in the Kahler Project area stop flowing between approximately July and October.

The harvest combined with the fuel treatments are expected to make the riparian canopy more resilient to wildfire by reducing or removing intermediate and ladder fuels, and ground fuels.

These Alternatives propose to prescribe burn the units with activity fuels, followed by landscape underburning of most of the project area. The landscape burning would be divided into 19 burn blocks, totaling approximately 31,000 acres. Included in this total are 1189 acres in the Wall Creek Watershed and 1139 acres in the Upper Rock Creek Watershed. The burning will extend beyond the Kahler Watershed so that existing roads can be used for fire lines. It is possible that a modest amount of fireline would need to be constructed to keep prescribed fire off of private lands. No other fire lines are expected to be built, unless there is a resource need that is currently unknown.

Alternative 2 contains approximately 682 acres of Class 4 RHCAs which would contain activity fuels and would be burned as individual units, and later underburned as parts of burn blocks. Alternative 3 contains approximately 657 acres of Class 4 RHCAs with the same activities. There are an additional 1,912 acres of Class 4 RHCAs in the Kahler project area which would be underburned in Alternative 2 and 1,937 acres in Alternative 3. Since these acres are not in units, they are not dense, dry forest stands. Many are range land with a few trees. Some are wetlands. There would be no lighting of fire in Class 1, 2, and 3 RHCAS, but it would be allowed to back into them. The backing fire is not expected to reach shade casting vegetation and trees, because the burn prescription would call for low intensity burning. Also, fuels along flowing streams tend to have higher moistures than upland fuels, and so are less likely to burn.

Ignition would also occur in RHCAs adjacent to private land boundaries, to ensure that prescribed fire would not cross the boundaries. The areas ignited would be limited to approximately 100’ along the boundary, so no more than 0.5 acres would be ignited in each RHCA. This burning may affect shade casting vegetation and trees. However, because of the low fire intensity, trees larger than 12 inches are not likely to be affected (see BMP Effectiveness section in the Hydrology Report). Grass, forb, and hardwood vegetation is expected to re-sprout after burning. Trees smaller than 12 inches may be affected, but because of the low fire intensity, low coverage of fire area (see below), and because the streams dry up in summer, it is not expected that there would be a measurable increase in stream temperatures downstream or a measurable increase in sedimentation.

During prescribed burning "windows," riparian areas usually have higher fuel moistures than adjacent upland areas, and would be expected to burn at lower intensities than the uplands. Also, prescribed fire personnel have the ability to locally manipulate burn intensities by varying the rate and location of ignition. This ability increases the likelihood that burn intensities would be kept low in riparian areas, thus protecting shade casting trees and reducing the likelihood of erosion and sedimentation.

Monitoring of three prescribed burn units in 2005 found that 7 percent of green trees 12 inches DBH and larger were killed by the burns. Nineteen of the 22 dead trees were in a unit which was burned at a higher intensity in order to reduce juniper encroachment. The other two units had less than 1 percent mortality to 12 inch and larger trees (Farren, 2006A). The monitoring was done 12 to 24 months after the burning. Observations made after 2005 indicated that there had been more mortality after the original monitoring. Because of this monitoring and observations, it is expected that 1 to 3 percent of shade casting trees would be killed by prescribed burning

which reached into riparian areas. It is possible that tree mortality at these levels would measurably affect shade and temperature, but unlikely during the critical period in July and August as streams are typically not flowing.

The prescribed burn monitoring in 2005 also found that 75 percent of the areas had not burned or had low burn severity after burning, 22 percent had moderate burn severity, and 3 percent had high burn severity. The high severity areas were indicated by consumption of the duff layer, root crowns and surface roots of grasses. However, the high severity areas were not continuous, but part of a mosaic of burn severities, including unburned (Farren 2006a). The areas of high severity burns contained exposed mineral soil, and would be expected to erode during high intensity precipitation or run-off. However, because the high severity areas were not continuous, and were interspersed with areas of intact duff and vegetation, surface flow of water did not carry a measurable amount of sediment into streams. Similarly, it is unlikely that the prescribed burning proposed by Alternative 2 would cause measurable increases in stream sedimentation.

Safety risk tree falling may cut some large, green, merchantable sized trees. Any trees or snags cut in RHCAs would be left where they fall, unless they were within the silvicultural prescription or if the stream met PACFISH standards for current and future large woody material. It is possible that some of the danger trees cast shade on streams. However, safety risk trees tend to be relatively scarce. When safety risk trees were cut along 20 miles of Forest Road (FR) 10 in 2003, there were a total of 102 trees cut, an average of approximately 5 trees per mile. It was estimated in 2008 that 19 safety risk trees were growing in RHCAs on a total of 12.4 miles of FR 1003 and FR 1012. This equals approximately 1.5 safety risk trees in RHCAs per mile of road, which is a relatively low density of safety risk trees. The Action Alternatives propose to cut safety risk trees along 25 miles of haul routes in RHCAs. The assumption is that safety risk trees in the Kahler Project RHCAs are growing at similar densities to those along FR 1003 and 1012, so relatively few would be cut.

Safety risk trees are selected because they threaten to fall on a road or travelway, and because they have at least one defect. The defects suggest that these trees are likely to fall in the relatively near future, thus they tend to be shorter-lived than trees without defects. The defects may involve dead or fallen tops, which reduces their ability to cast shade. Because danger trees tend to be relatively scarce, short-lived, and may have dead or missing tops, it is unlikely that falling them for this project would measurably affect stream temperatures.

## Water Quality Standards

The Oregon Department of Environmental Quality has identified water quality limited streams throughout Oregon as required by the Clean Water Act, Section 303 (d). The most recent Water Quality Assessment Database may be viewed at the DEQ website: (http://www.deq.state.or.us/wq/assessment/rpt2010/search.asp). See the Hydrology Report for information on water quality impairments, beneficial uses, Total Maximum Daily Load, the relationship between the Forest Service and the DEQ, Water Quality Restoration Plans, Best Management Practices, and Monitoring and Evaluation practices.

The Kahler Project is located in the John Day/Clarno Highlands Eco-region (Thorson and others, 2003) of the Northern Blue Mountains of Oregon. It consists of forest land with annual precipitation ranging from approximately 15 to 25 inches. The area has an interior, continental climate with cold winters and warm summers. Most precipitation falls during the November through May period. While a modest snow pack usually develops in the winter, rain is possible during all months of the year. This is because the topography allows the incursion of relatively

warm, moist marine air from the Pacific Ocean into the area (Ferguson, 2000). The area is in the transitional rain on snow zone.

The hydrologic regime is flashy, with peak flows occurring relatively early in the spring after snow melt or rain storms, when the soil is saturated. Low precipitation in the warm season results in decreasing stream flows through summer and early fall. Seasonal low flows or base flows derive from groundwater which is stored in shallow aquifers during the wet season. The groundwater is released through springs and directly into streams. Springs form the headwaters of many of the principle streams in the area. The temperature of groundwater when it is released at the surface is generally in the mid 50º F. range, approximating the mean annual air temperature. However, because of low stream flows and high air temperatures, stream temperatures tend to increase in the summer, with the highest 7 day maximum moving average temperatures occurring in July and August.

The headwater streams in the Kahler Project area that are proposed for harvest are intermittent. They stop flowing between approximately July 1 and November 1 each year, and do not contribute to elevated temperatures downstream. Within a few hundred feet of certain springs in or near some streams, there is perennially flowing water. These isolated segments of perennial flow are not included in harvest units, and also do not contribute to temperatures downstream.

Localized convective storms occur in the summers. These storms are capable of producing short periods of high intensity rainfall, and which can cause erosion if the soil is exposed. However, the storms are highly localized, and account for a relatively small portion of the total precipitation.

Loss of canopy and ground cover increases raindrop impact on exposed soil surfaces with various effects that increase risk of surface runoff and soil erosion. Steep terrain and soil erodibility contribute to increased erosion potential. Precipitation patterns and intensity would largely determine the magnitude of erosion and sedimentation. Erosion tends to increase with the first rains following a disturbance, and decline rapidly as watersheds revegetate and forest litter covers the ground. Stream bank erosion is likely to increase in locations with shallow rooted plants which lack woody material.

Eroded sediments on hill slopes may take years or decades to reach stream systems and much of the mobilized sediment will be deposited in headwater channels and smaller tributaries (Elliot, 2005). Stream and valley gradient and morphology are important factors influencing the fate of sediment delivered to channels. Instream storage, routing, and transport are controlled in part by high flows, instream wood, and riparian vegetation. In general, higher gradient channels lacking large wood will be zones of transport, compared to lower gradient channels with abundant instream wood, which will be zones of sediment deposition.

The Kahler Project Area contains streams of first through fifth order. Many of the first order streams are ephemeral, and the second and third order streams are intermittent. Ephemeral streams are those which form in depressions in the landscape, flow after precipitation or snowmelt, but lack evidence of annual scour and deposition. Ephemeral streams are sometimes referred to as Class 5 streams. Intermittent streams have well defined channels and evidence of annual scour and deposition. Intermittent streams are Class 4 and Category 4. However, intermittent streams which have fish when they are wet are Class 1 or 2, and Category 1.

In the Pacific Northwest, low-order (e.g. first- and second-order) stream segments represent >70% of the cumulative channel length in typical mountain watersheds. Hence low-order

channels are the primary conduits for water, sediment, and vegetative material routed from hill slopes to higher-order rivers (Naiman, 1992).

Because the low order streams form so much of the stream network, and are the primary conduits for water, sediment, and vegetative material, they are protected by the Clean Water Act, the Forest Plan, PACFISH, and Best Management Practices under all Alternatives. There are 110 miles of intermittent streams in the part of the Watershed managed by the Forest Service.

The stream channels appear to be gravel/silt bottomed with pool/riffle morphology. Many channels are wide and shallow, with some deeper, more incised channels. The incised channels generally have unstable banks. Most reaches appear to be zones of transportation. The few zones of deposition appear to be associated with woody materials in the channel and floodplain. The riparian canopy in the units is almost exclusively conifers, and varies between open and dense.

**Table 3-2 Existing road densities in miles per square mile and number of road crossings.**

| | |
|---|---|
| Existing perm road density | 3.9 |
| Existing RHCA road density | 4.6 |
| Existing crossings | 277 |

There are approximately 202 miles of roads in the Project Area. The road density is 3.9 miles of road per square mile of project area. There are 31 miles of roads in riparian areas, and the riparian road density is 4.6 miles per square mile. The total road density is somewhat greater than the average density for the Umatilla National Forest, which is 3.4 miles per square mile (USDA, 1990).

Forest roads are more likely to erode than forest soil because they contain large continuous areas of bare soil. Because of the lack of vegetative cover, they provide efficient locations for collecting and channeling rain water and snow melt water. In addition, because road surfaces are compacted, they have much less capacity to infiltrate surface water than uncompacted forest soil. Reduced infiltration increases the volume of water that can channel on the road surface. "Surface erosion from road surfaces, cut banks, and ditches represents a significant and, in some landscapes, the dominant source of road-related sediment input to streams" (Gucinski et al. 2001).

Road crossings of streams are often the places where eroded soil enters the water. Eroded soil is mobilized by rain and snow melt. "Most road problems during floods result from improper or inadequate engineering and design, particularly at road-stream crossings..."(Gucinski et al. 2001). There are approximately 277 road crossings of streams in the Kahler Project Area.

**Table 3-3 Road Crossings within the Kahler Project Area**

| Stream Class | Total crossing | Without Culverts | % w/o Culverts | % with Culverts |
|---|---|---|---|---|
| 1 | 1 | 0 | 0% | 100% |
| 2 | 2 | 0 | 0% | 100% |
| 3 | 41 | 11 | 27% | 73% |
| 4 | 233 | 94 | 40% | 60% |
| Grand Total | 277 | 105 | 38% | 62% |

### Early Riparian Impacts

Refer to Hydrology Report in the Appendix for information on history and riparian impacts in the John Day River basin.

# Fisheries

## TES and MIS Aquatic Life Histories

### Threatened, Endangered and Sensitive (TES) Fish and Habitat

Middle Columbia River (MCR) Steelhead and their designated critical habitat are the only species and habitats listed under the Endangered Species Act (ESA), which are found in the project area (see Figure 1 of Fisheries Specialist Report). Information on the Regional Forester's sensitive species suspected or known to occur on the Umatilla National Forest can be found in Table 3.

### Management Indicator Species (MIS)

Steelhead trout (anadromous) and rainbow trout (resident redband) are the designated aquatic Management Indicators Species (MIS) for the Umatilla National Forest. The Forest Plan was amended in 1995 by PACFISH which incorporated standards and guides to allow for near-natural rates of habitat restoration, and avoid adverse effects to listed species. Steelhead and rainbow trout are different life history expressions of the same species. Streams surveys and broadscale efforts, i.e. PACFISH/INFISH Biological Opinion, (aka "PIBO") monitoring are in place to collect data and monitor habitat conditions.

### Middle Columbia River Steelhead and their Critical Habitat

Steelhead are the anadromous form of rainbow trout, a salmonid species native to western North America and the Pacific Coast of Asia. Redband trout are another name for native resident rainbow trout in the Interior Columbia River Basin and are indistinguishable visually from its anadromous form as juveniles. MCR Steelhead rear in freshwater streams for their first 1 to 3 years prior to smolting. They then migrate to the ocean where they can spend up to 3 years before returning to their native freshwater stream to spawn. Unlike Pacific salmon, steelhead are iteroparous, meaning they do not necessarily die after spawning and are able to spawn more than once, although this varies among runs.

Steelhead display two broad life history patterns typically called summer-run and winter-run. Steelhead spawning occurs between March and May. Prior to spawning, maturing adults hold in pools or in side channels to avoid high winter flows. Typically, they spawn in stream reaches with a moderate to high gradient. Fry typically emerge between April and June. Summer steelhead in the NFJD can rear in freshwater habitat up to 4 winters. Migration to the ocean typically occurs at age 2 for wild summer steelhead, while most hatchery smolts migrate at age 1 (Carmichael and Taylor, 2009).

The North Fork John Day (NFJD) summer steelhead population is distinct but, part of the larger John Day River Major Population Group (MPG), within the Mid-Columbia Steelhead ESU. This population of steelhead occupies the highest elevation, and wettest area in the John Day basin. According to the Oregon Mid-C Steelhead Recovery Plan (Carmichael and Taylor 2009), the NFJD River Summer Steelhead population is at very low risk based on current abundance and productivity. This analysis was based on population abundance/productivity and spatial structure/diversity. Abundance/productivity is based on adult spawner returns and smolt to adult

ratios (SAR). Spatial structure/diversity is based on analysis of spatial extent or range of the population, genetic variation, spawner composition, population connectivity and major life history strategies. Although the NFJD summer steelhead population is rated as highly viable and meeting recovery goals, the John Day River MPG remains below viable status due to the "maintained" population status for the other three populations in this MPG(Ford et al, 2010; NMFS, 2011).

Designated critical habitat for Middle Columbia River steelhead within the NFJD subbasin includes all rivers and stream reaches accessible to steelhead below long-standing natural barriers (*Federal Register* Vol. 70 (170); September 2, 2005). There are 7.49 miles of designated critical habitat for Middle Columbia River steelhead within the project area (see Figure 1 of Fisheries Specialist Report). Only 5.1 miles of that habitat are accessible to steelhead due to a 12 foot high waterfall on Henry Creek. The waterfall prevents steelhead from accessing 2.39 miles of designated critical habitat.

### Mid-Columbia Spring Chinook Salmon and Essential Fish Habitat

The federal Magnuson-Stevens Act (MSA) requires analysis for effects to Essential Fish Habitat (EFH) specifically for Pacific salmon. EFH includes all streams, lakes, ponds, wetlands, and other currently viable water bodies and most of the historically accessible habitat to Pacific salmon species. The riparian zone adjacent to these waterways is also considered EFH. This zone is defined as shade, sediment, nutrient/chemical regulation, streambank stability, and LWD/organic matter.

There is no EFH within the project area. The closest EFH is on the North Fork John Day River (~5.5 miles downstream of the project area).

### Bull trout and their critical habitat

Bull trout (Salvelinus confluentus) are members of the Salmonidae family. They are often referred to as char, which is the common name for members of the genus *Salvelinus*. In general, chars are cold water species that inhabit Pacific slope drainages from northern California through British Columbia to extreme southeastern Alaska (Meehan and Bjornn 1991). Bull trout were separated from Dolly Varden (Salvelinus malma) in 1978 (Haas and McPhail 1991); which are a species that is phenotypically similar to bull trout. Dolly Varden are considered a coastal form of char, while bull trout are largely restricted to interior regions of the northwest.

Bull trout originated in the Columbia River Basin (Cavender 1978) and dispersed through headwater exchanges and perhaps ocean migrations (Bond 1992). In general, bull trout are a cold water species that inhabits Pacific slope drainages from northern California through British Columbia to extreme southeastern Alaska (Meehan and Bjornn 1991). Natural climactic warming and loss of cold water habitats since the Pleistocene period exacerbated by effects of human activities have reduced their distribution (Cavender 1978). Bull trout no longer exist in California, although a few fish may have survived a reintroduction using stock from Oregon.

There are no Bulltrout or their designated critical habitat within the project area. The closest designated critical habitat is on the North Fork John Day River (~5.5 miles downstream of the project area)

### Redband Trout

Redband trout are an unclassified form of rainbow trout found east of the Cascade Mountains in Oregon and Washington, in northern California, and in eastern British Columbia. Behnke (1979)

noted two main evolutionary lines of rainbow trout dating back to the Pleistocene; the coastal rainbow trout, and the inland redband trout. Both of these evolutionary lines include steelhead populations of their respective areas. The redband evolutionary line can be further subdivided to account differentiation that has occurred due to isolation since the Pleistocene. These divisions range from the golden trout of the Kern River, California, to the Kamloops trout of British Columbia. Due to stocking of hatchery rainbow trout by humans and natural interbreeding between the highly migratory coastal and inland forms, genetically pure populations of redband can generally be found isolated above migratory barriers where stocking has not occurred (Behnke 1979). Positive identification can only be determined by electrophoretic or DNA analysis. Because redband trout are prevalent over such a wide area, and because the systematics are, as of yet, not clearly defined, the Forest, after consulting with local representatives from state fish and wildlife agencies, has chosen to address redband trout as those genetically pure, native rainbow trout east of the Cascade Mountains.

Redband trout require stream and riparian habitat conditions in the area favorable to spawning and rearing. Factors concerning their habitats include water temperature, water quality, timing and quantity of peak stream flows, and physical in-stream and riparian habitat characteristics. Good water quality is essential for spawning and rearing. Redband require similar in-stream habitat characteristics as other cool-water salmonids. A variety of habitat types are important in providing adequate habitats for all life stages.

Redband trout are found in approximately 5.0 miles of streams within the project area.

### Regional Sensitive Invertebrate and Vertebrate Species

A number of sensitive invertebrate and aquatic vertebrate species are known or suspected on the Umatilla National Forest. Their known or suspected presence in the analysis area is described in Table 3.

**Table 3-4 Regional Forester's List of Sensitive Invertebrate and Vertebrate Species Present or suspected on the Umatilla NF**

| Regional Sensitive Invertebrate | Habitat Description* | Habitat Present in Analysis Area | Species Present in Analysis Area | Known Current Distribution |
|---|---|---|---|---|
| Western Ridged Mussel *(Gonidea angulata)* | Occur in streams of all sizes of low to mid-elevation watersheds. Common in stable stream reaches, tolerant of fine sediments and occupy depositional areas. | Possibly Alder Cr., East Bologna Canyon Cr., Henry Cr. and Wheeler Cr. below the project area. | Assumed present throughout analysis area. | Widely distributed west of the Continental Divide, CA to BC. It is mainly distributed east of the Cascades. |
| Hells Canyon Land Snail *(Poplar oregonian)* | Found in mod xeric, open, dry large-scale basalt taluses at lower elevations on steep, cool NE facing slopes in major river basins. | No | No | Limited portion of the northern Hells Canyon drainage, and the lower Salmon River. |
| Shortface Lanx (*Fisherola nuttalli*) | Occurs in large low to mid-elevation riverine habitats. Common in unpolluted, cold, well oxygenated, perennial streams with cobble-boulder substrate. | No | No | Found throughout the Snake River, Mid-Columbia basin limited to the Upper and Lower Deschutes, Lower John Day, Upper Columbia (Okanagan R.) |
| Columbia clubtail (*Gomphus lynnae)* | A variety of river habitats, which can range from sandy or muddy or rocky, shallow rivers with occasional gravelly rapids. Water flow tends to be slow-moving. | Yes | Assumed present throughout analysis area | Yakima River, Benton Co. John Day River, Wheeler and Grant Co. from Twickenham to Monument, Owyhee River, Malheur Co. |
| Westslope Cutthroat Trout *(Oncorhynchus clarkii lewisi)* | Cold clear, water, high mountain streams with variable habitat complexity | No | No, the project area is outside the historic, known current and suspected spatial range of the species | Found throughout the Mid-Columbia River Basin, NFJD and Upper John Day R. subbasins |

*Frest and Johannes 1995, Nedeau et al. 2009, Neitzel and Frest 1990, NatureServe Explorer 2009, Paulson 1999, Scheuering 2006, forest stream survey data (on file).

The westslope cutthroat present in the NFJD subbasin on the Umatilla National Forest (UNF) may have originated from earlier transplants from the Upper John Day subbasin, where they are considered native. Westslope cutthroat are considered a sensitive species on the UNF. The only known or suspected populations are located in high-elevation watersheds of the NFJD subbasin, far upriver from the Kahler analysis area.

## Existing Condition

### Methodology and Assumptions

For this document, the environmental baseline discussion and discussion of effects use FS habitat stream survey data and ODFW stream survey data as well as GIS analysis and the Interior Columbia Basin Ecosystem Management Project (ICBEMP) summary values (McKinney et al. 1996, see table 6) as directed under ICBEMP memorandum FS agreement No. 03-RMU-11046000-007, and reports in published scientific literature. Water temperature data is referenced from the Umatilla National Forest monitoring records. The seven-day moving maximum and average summer time water temperatures are measured. Stream surveys follow the Region 6 Level II stream survey protocol (following a modified Hankin and Reeves 1988 protocol).

Surveys have been completed and updated for the major streams in the Project Area. The surveys were conducted to document stream conditions and establish a baseline. See Table 4 for a list of completed stream surveys and the year they were surveyed.

**Table 3-5 Hankin-Reeves Stream Surveys for the Kahler Project Area**

| STREAM NAME | SURVEY YEAR |
|---|---|
| Alder Creek and tributaries | 1992 ,2007, 2013 |
| 2 unnamed tributaries | 1994, 2013 |
| Henry Creek | 1992, 1994,2007, 2013 |
| Candis Creek (tributary to Henry) | 1992, 2013 |
| Davis Creek (tributary to Henry) | 1992 |
| Kahler Creek | 1992, 2013 |
| Tamarack Creek | 1991, 2013 |
| Whiskey Creek (tributary to Tamarack) | 1994 |
| Wheeler Creek | 1992, 2007 |

The Kahler Project proposes timber harvest, non-commercial thinning, mechanical fuel treatments, road use, construction, and maintenance, and prescribed burning. Each of these activities carries potential for effects to some component of aquatic habitat. Water quality, habitat quality, and the ability of the watershed and riparian areas to act as a buffer to timber activity and its connected actions are components of aquatic habitat considered in this analysis. Pool frequency and quality, large woody debris (LWD), width/depth ratios, and water temperature are habitat components that are potentially affected by timber activities. These habitat parameters are specifically addressed as PACFISH Riparian Management Objectives (RMO's) (referencing Section 7 Fish Habitat Monitoring Protocol for the Upper Columbia River Basin, USDA Forest Service, 1994), and are summarized in Table 5. These objectives are metrics used to assess the complexity of habitat available for fish within the analysis area.

**Table 3-6. PACFISH RMO's (UNF LRMP as amended by PACFISH, 1995)**

| Habitat Feature | RMO's |
|---|---|
| Pool Frequency<br>Wetted Width (ft)<br>Number of pools/mile | <br>10 20 25 50 75 100 125 150 200<br>96 56 47 26 23 18 14 12 9 |
| Water Temperature | Compliance with Water Quality standard or maximum Temp. <68 ºF |
| Large Woody Debris | Eastern Oregon > 20 pieces/mile, >12 inch diameter, >35 ft. length |
| Bank Stability | >80 percent stable |
| Width/Depth Ratio | <10, mean wetted width divided by mean depth |

Under the Section 7 Habitat Monitoring Protocol for the Upper Columbia River Basin (USDA 1994), PACFISH RMO's are intended to apply to fish bearing Rosgen (1996) C-type channels. These types of channels are most commonly found in low-gradient channels in wide alluvial valley bottoms. For example, monitoring protocol for determining pool frequency requires count of only pools greater than 1 meter (~3 feet) deep in low gradient (1% -2%) stream channels. Streams within the analysis area that do not fit these criteria include Alder Creek, Henry Creek, Kahler Creek and Tamarack Creek. These streams/stream reaches are located in narrow, moderate to steep gradient valleys.

**Table 3-7 Calculated ICBEMP pool frequency values (McKinney et al. 1996)**

| Wetted Width (ft.) | Pools/mile** |
|---|---|
| 0-5* | 39* |
| 5-10 | 20 |
| 10-15 | 12 |
| 15-20 | 8.4 |
| 20-30 | 5.9 |
| 30-35 | 4.5 |
| 35-40 | 3.9 |
| 40-65 | 2.8 |
| 65-100 | 1.8 |

*Streams less than 5 feet wide, reaches would be expected to have a lower density of pools; however, there is no available way to calculate an appropriate value so standard would defer to the value of 39 pools per miles selected by the USFWS.

**To calculate the standard pools/mile using ICBEMP value of 0.028 for specific widths 147.8/channel width = standard pools/mile.

## Water Quality

### Stream Temperature

The maximum seven-day moving average temperatures for Henry Creek and Wheeler Creek exceeded 64 degrees Fahrenheit every year they were monitored. Stream temperature monitoring would continue in the Kahler Watershed until a background range is established.

Both Kahler and Wheeler Creeks had their riparian areas burned during the Wheeler Point Fire in 1996. Temperature data shows an increase in stream temperature for these streams beginning in 1997. As the riparian area recovers, a gradual decline in stream temperature begins to show starting in 2004. See Table 7 in the Fisheries Specialist Report for average stream temperatures in the Kahler Area.

The headwater streams in the Kahler Project area that are proposed for harvest are intermittent. They stop flowing between approximately July 1 and November 1 each year, and do not contribute to elevated temperatures downstream. Within a few hundred feet of certain springs in or near some streams, there is perennially flowing water. These isolated segments of perennial flow are not included in harvest units, and also do not contribute to elevated temperatures downstream.

### Sediment

East Bologna Canyon Creek is currently 303d listed for not meeting the sediment standard. The John Day River downstream of the Kahler Project is also 303d listed for biological criteria and temperature.

The beneficial uses identified by the state for water in the project area, which may be affected by the Kahler Project activities are fish and aquatic life. The practices that the Forest Service uses to insure there would be no degradation to streams from the activities are detailed in the Best Management Practices section of the hydrology specialist report.

### Bank Stability

The 2013 stream surveys conducted within the project area collected information on unstable stream banks. The percentages of stable stream bank for surveyed streams are found in Table 8 of the Fisheries Specialist Report.

## Forest Vegetation

#### Affected Environment

Upland forests in the Kahler area have undergone relatively recent damage from defoliating insects (spruce budworm and tussock moth), uncharacteristic wildfire effects associated with the 1996 Wheeler Point fire, and dense forests containing low vigor trees are symptoms of impaired forest health and deteriorating ecosystem integrity. The causes of these symptoms are related to historical changes in species composition, forest structure, and stand density. If composition, structure, and density are not moved back within their historical ranges of variation, then insect and fire problems will continue into the future.

Specifically, there is a need to address the following conditions in the Kahler planning area:

- Dry-forest sites currently support too much of the Douglas-fir forest cover type, and too little of the western larch forest cover type (an historical range of variation (HRV) analysis found that Douglas-fir is over-represented, or too plentiful, and western larch is under-represented).
- Dry-forest sites currently support too much of the stem exclusion (SE) and understory reinitiation (UR) structural stages, and too little of the old forest single stratum structural (OFSS) stage (HRV analysis found that SE and UR are over-represented, and OFSS is under-represented).
- Dry-forest sites currently support too much of the high stand density class, and too little of the low density class (HRV analysis found that high stand density is over-represented, and low stand density is under-represented). High stand density is a management concern because it contributes to insect and disease outbreaks, uncharacteristic levels of crown fire, and other disturbance processes.

Disturbances have influenced vegetation conditions for forested landscapes throughout the Blue Mountains, including the Kahler planning area. Bioregional assessments examining vegetation

conditions and trends concluded that existing conditions for dry forests, such as those in the Kahler area, are uncharacteristic (departed) when compared with the historical (pre-European settlement) situation (Caraher et al. 1992, Gast et al. 1991, Henjum et al. 1994).

**Table 3-8 Acreage summary for the Kahler forest vegetation affected environment**

| | |
|---|---|
| Approximate acreage of National Forest System (NFS) lands in the Kahler planning area | 32,840 |
| Minus NFS lands in unsuitable management areas A6, C1, and D21 | 1,750 |
| **Total NFS lands within the affected environment** | 31,090 |
| Plus NFS lands proposed for treatment in unsuitable management areas2 | 30 |
| **Total NFS in forest vegetation affected environment for analysis purposes** | 31,120 |
| Affected environment modified in alternative 1 | 0 |
| Affected environment modified in alternative 2 | 12,220 |
| Affected environment modified in alternative 3 | 11,540 |

**[1] Management areas A6, C1, and D2 are designated as unsuitable for timber production by the Forest Plan. Riparian Habitat Conservation Areas, a requirement of the PACFISH Forest Plan amendment, are also unsuitable (although timber harvest is permitted in RHCAs under certain circumstances); however, RHCAs are not mapped in a spatially explicit manner for the Forest Plan (e.g., RHCAs are not contained on the official Forest Plan management allocation GIS layer), so their acreage is not included in this line item.**

**[2] Thirty acres of unsuitable management area is proposed for treatment in the Kahler planning area; this acreage occurs near the Tamarack fire lookout and its associated administrative site. Since this treatment acreage involves unsuitable lands, the fire lookout treatments can only be authorized with a Forest Plan amendment. To account for changed vegetation conditions following treatment, the 30 acres of unsuitable NFS land were included in the forest vegetation affected environment.**

Research studies (Hessburg et al. 1999, Johnson 1994, Lehmkuhl et al. 1994, Mutch et al. 1993, Oliver et al. 1994, Quigley and Arbelbide 1997, Tanaka et al. 1995, Wickman 1992), along with local watershed assessments and environmental analyses (USDA Forest Service 2004), have shown that existing dry-forest conditions in the interior Pacific Northwest depart substantially from the historical situation, and that departures reflect the interacting effects of three historical factors: fire exclusion, herbivory from native and domestic ungulates, and selective timber harvest.

Western spruce budworm caused widespread tree damage and mortality in both Douglas-fir and grand fir in the 1980s and early 1990s; budworm damage: (1) resulted in an increase in standing dead trees (snags); (2) caused physical damage to trees (expressed as dead tops, sweep, crook, forks, etc.); and (3) contributed to production of down woody material now present as surface fuels and as wildlife habitat (Sheehan 1996, Powell 1994).

Refer to the Forest Vegetation Report, figure 7, for a year-by-year progression of spruce budworm activity for the Kahler planning area.

This insect-caused disturbance process resulted in mortality of Douglas-fir and grand fir trees, along with substantially decreased growth and vigor for the surviving host trees, and it also created large accumulations of down wood in areas where tree mortality occurred.

Bark beetles and root disease continue to kill trees throughout the planning area, with western pine beetle causing mortality in large, old ponderosa pines, and mountain pine beetle killing younger pines occurring in high density conditions. Douglas-fir dwarf mistletoe is prevalent in Douglas-fir, and western dwarf mistletoe occurs in ponderosa pine, and both dwarf mistletoes are infecting understory regeneration (Schmitt and Spiegel 2010, 2012).

Timber harvest has been a disturbance agent in the Kahler area, and throughout eastern Oregon, for many decades (Oliver et al. 1994). District timber harvest records indicate past harvest in the Kahler planning area between 1940 and 2009 totaling 25,896 acres or 18,559 footprint acres (figure 8). Most of the acres harvested (22,066 acres) involved single tree selection cuts or partial removals, where individual trees or clumps of trees, generally large-diameter ponderosa pines and Douglas-firs, were removed.

The remaining harvest acres used a variety of cutting methods, including clearcutting (426 acres), shelterwood cutting (193 acres), overstory removal cutting (1,256 acres), seed-tree cutting (204 acres), and commercial thinning (736 acres). In addition, even areas with no recorded timber harvest show some evidence of previous partial-removal timber harvest, with stumps and skid trails scattered throughout them.

Fire, and subsequent suppression of fire by humans, had an important influence on vegetation conditions in the planning area. Historical fire occurrence, in combination with previous timber harvest, is largely responsible for the composition of existing overstory trees (especially the older trees), whereas fire exclusion is primarily responsible for the composition of current understory trees.

The Wheeler Point fire ignited on August 10, 1996 and grew rapidly to 22,000 acres in size. Approximately 7,500 acres of the fire affected National Forest System (NFS) lands; about 6,420 of NFS acres occur in the Kahler planning area. Effects of the Wheeler Point fire on dry-forest conditions in the Kahler planning area, where the fire burned mostly with uncharacteristic (stand-replacing) effects, are a definite management concern, both now and in the foreseeable future (See Forest Vegetation Report for photographs depicting post-fire conditions following the 1996 Wheeler Point fire).

### Existing Condition for Species Composition (Forest Cover Types)

Table 3-5 summarizes existing species composition (forest cover types) for the forest vegetation affected environment. It shows that the predominant forest cover type is ponderosa pine (55% of the affected environment has ponderosa pine as the majority or plurality tree species), followed by Douglas-fir (25%), non-forest grassland and shrubland (12%), and grand fir (5%). The spatial distribution of forest cover types for the affected environment portion of the Kahler planning area is presented in figure 10.

**Table 3-9 Existing condition for species composition (forest cover types) of the Kahler forest vegetation affected environment**

| Forest Cover Type | Area (Acres) | Area (Percent) |
|---|---|---|
| Douglas-fir | 7,760 | 25 |
| Engelmann spruce | 60 | < 1 |
| Grand fir | 1,440 | 5 |
| Lodgepole pine | 10 | < 1 |
| Nonforest | 3,840 | 12 |
| Ponderosa pine | 17,220 | 55 |
| Quaking aspen | 20 | < 1 |
| Western juniper | 740 | 2 |
| Western larch | 30 | < 1 |

| | | |
|---|---|---|
| Total | 31,120 | 100 |

***Notes:*** **Summarized from the Kahler vegetation database. Nonforest is not a forest cover type, but it is included to account for all of the affected environment acreage within the planning area. This analysis includes unsuitable NFS lands included in the Kahler proposed action (see table 6, footnote 2).**

Historical (mid-1880s) vegetation conditions agree with soils information for the Kahler planning area. About 96% of the Kahler planning area soils are Mollisols (Archuleta 2014), a soil order typically formed in grassland or herb-dominated environments (Meurisse et al. 1991). The presence of abundant Mollisols does not necessarily indicate that trees have invaded areas previously dominated by grassland or herbland, but it does suggest that historically (a time period spanning millennia, which is appropriate for evaluating soil-formation processes), the Kahler planning area was dominated by open, savanna-type forests.

Within the Kahler planning area, there also exists a small amount of quaking aspen. Aspen stands in the planning area are quite small (the largest stand occupies app. 9 acres, and many stands are 1 acre or less in size), so aspen typically occurs as inclusions within larger stands assigned to a coniferous cover type. Since aspen provides important ecosystem services related to its value as wildlife habitat and for vegetation biodiversity, it is carefully monitored during vegetation analysis, even though it does not occur as a separate cover type. Known aspen occurrences for the Kahler planning area are summarized in table 9 and figure 12 of the Forest Vegetation report.

### HRV Analysis for Forest Vegetation Affected Environment: Species Composition

An HRV analysis was completed for species composition of the Kahler forest vegetation affected environment (Table 3-10. Because species composition varies by biophysical environment, the HRV analysis is stratified by potential vegetation group: dry upland forest (app. 26,980 acres). Note that Moist Upland Forest PVG is excluded because it has too few acres for a credible HRV analysis. The entire affected environment is included in table 10 except for nonforest (3,840 acres) and Moist UF PVG (300 acres).

Forest cover types are used as an indicator for the species composition measure. The information presented in table 10 suggests that the Douglas-fir forest cover type is currently over-represented on Dry UF PVG sites because it exceeds the upper limit of the historical range of variation (HRV). The western larch cover type is under-represented because it is slightly below the lower limit of its historical range. The western juniper, ponderosa pine, and grand fir cover types occur within their historical ranges, so their current representation in the Kahler planning area is appropriate for Dry Upland Forest sites.

**Table 3-10: HRV analysis for forest cover types of the Kahler forest vegetation affected environment**

| | DRY UPLAND FOREST PVG | | | |
|---|---|---|---|---|
| | Historical Range | | Existing Amount | |
| Forest Cover Type | Percent | Acres | Percent | Acres |
| Douglas-fir | 5-20 | 1,350-5,400 | 29 | 7,760 |
| Grand fir | 1-10 | 270-2,700 | 5 | 1,260 |
| Ponderosa pine | 50-80 | 13,500-21,600 | 64 | 17,220 |
| Lodgepole pine | 0 | 0 | 0 | 0 |
| Subalpine fir and spruce | 0 | 0 | 0 | 0 |
| Western larch | 1-10 | 270-2,700 | 0 | 0 |
| Western juniper | 0-5 | 0-1,350 | 3 | 740 |

| Forest Cover Type | DRY UPLAND FOREST PVG | | | |
|---|---|---|---|---|
| | Historical Range | | Existing Amount | |
| | Percent | Acres | Percent | Acres |
| Western white pine | 0-5 | 0-1,350 | 0 | 0 |
| Whitebark pine | 0 | 0 | 0 | 0 |
| Total | | | 101 | 26,980 |

*Notes:* Existing amounts are taken from the Kahler vegetation database. Gray shading indicates cover types that are above or below the historical range of variation. Historical ranges are taken from Martin (2010). Lodgepole pine, subalpine fir and spruce, and whitebark pine have zeroes for historical ranges because they would not be expected to occur on the dry upland forest biophysical environment. This analysis includes unsuitable NFS lands included in the Kahler proposed action (see table 6, footnote 2). It does not include: 1) aspen acreage (because an historical range is not provided for aspen in Martin 2010); 2) Dry UF acreage located outside of the affected environment but within the Kahler planning area; or 3) Moist UF PVG or nonforest acreage.

### Existing Condition for Forest Structure (Structural Stages)

Table 11 summarizes existing forest structure (structural stages) for the Kahler forest vegetation affected environment. It shows that the predominant forest structural stage is stem exclusion (30% of the affected environment has a stem exclusion structural stage), followed by understory reinitiation (28%), stand initiation (17%), and nonforest grassland and shrubland (12%). The spatial distribution of forest structural stages for the affected environment portion of the Kahler planning area is presented in figure 13.

**Table 3-11: Existing condition for forest structural stages of the Kahler forest vegetation affected environment**

| Forest Structural Stage | Area (Acres) | Area (Percent) |
|---|---|---|
| SI: Stand Initiation | 5,140 | 17 |
| SE: Stem Exclusion | 9,330 | 30 |
| UR: Understory Reinitiation | 8,690 | 28 |
| OFSS: Old Forest Single Stratum | 1,550 | 5 |
| OFMS: Old Forest Multi-Strata | 2,580 | 8 |
| Nonforest (no structure assigned) | 3,840 | 12 |
| Total | 31,130 | 100 |

***Notes:* Summarized from the Kahler vegetation database. Nonforest is not a forest structural stage, but it is included to account for all of the affected environment acreage within the Kahler planning area. This analysis includes unsuitable NFS lands included in the Kahler proposed action (see table 6, footnote 2).**

### HRV Analysis for Kahler Forest Vegetation Affected Environment: Forest Structure

An HRV analysis was completed for forest structure of the Kahler forest vegetation affected environment (Table 3-12). Because forest structure varies by biophysical environment, the HRV analysis was stratified by potential vegetation group: dry upland forest (app. 26,980 acres). Note that Moist Upland Forest PVG is not included because it has too few acres for a credible HRV

analysis. The entire affected environment is included in table 12 except for nonforest (3,840 acres) and the Moist UF PVG (300 acres).

Forest structural stage is used as an indicator for the forest structure measure. The information presented in table 12 suggests that the stem exclusion and understory reinitiation forest structural stages are currently over-represented on Dry UF PVG sites because they exceed the upper limits of their historical ranges of variation. The old forest single stratum forest structural stage is under-represented because it is below the lower limit of the historical range of variation. The stand initiation and old forest multi-strata structural stages occur within their historical ranges, so their current representation in the Kahler planning area is appropriate for Dry UF PVG sites.

**Table 3-12: HRV analysis for forest structural stages of the Kahler forest vegetation affected environment**

| | DRY UPLAND FOREST PVG | | | |
|---|---|---|---|---|
| | Historical Range | | Existing Amount | |
| Forest Structural Stage | Percent | Acres | Percent | Acres |
| SI: Stand Initiation | 15-25 | 4,050-6,750 | 19 | 5,140 |
| SE: Stem Exclusion | 10-20 | 2,700-5,400 | 35 | 9,330 |
| UR: Understory Reinitiation | 5-10 | 1,350-2,700 | 32 | 8,600 |
| OFSS: Old Forest Single Stratum | 40-60 | 10,800-16,200 | 6 | 1,550 |
| OFMS: Old Forest Multi-Strata | 5-15 | 1,350-4,050 | 9 | 2,360 |
| Total | | | 101 | 26,980 |

***Notes:*** **Existing amounts are taken from the Kahler vegetation database. Gray shading indicates structural stages that are either above or below the historical range of variation. Historical ranges were taken from Martin (2010). This analysis includes unsuitable NFS lands included in the Kahler proposed action (see table 6, footnote 2). This analysis does not include Dry UF acreage located outside of the affected environment but within the Kahler planning area, or Moist UF PVG or nonforest acreage.**

## Existing Condition for Stand Density (Density Classes)

Table 3-7 summarizes existing stand density (density classes) for the Kahler forest vegetation affected environment. It shows that the predominant stand density class is high (40% of the affected environment has high stand density), followed by low stand density (33%), moderate stand density (15%), and nonforest grassland and shrubland (12%). The spatial distribution of stand density classes for the affected environment portion of the Kahler planning area is presented in figure 14 of the Forest Vegetation Report.

**Table 3-13: Existing condition for stand density (stand density classes) of the Kahler forest vegetation affected environment**

| Stand Density Class | Area (Acres) | Area (Percent) |
|---|---|---|
| Low | 10,190 | 33 |
| Moderate | 4,540 | 15 |
| High | 12,550 | 40 |
| Nonforest (no density assigned) | 3,840 | 12 |
| Total | 31,120 | 100 |

***Notes:* Summarized from the Kahler vegetation database. Nonforest is not a density class, but it is included to account for all of the affected environment acreage within the Kahler planning area. This analysis includes unsuitable NFS lands included in the Kahler proposed action (see table 6, footnote 2).**

### HRV Analysis for Kahler Forest Vegetation Affected Environment: Stand Density

An HRV analysis was completed for stand density of the Kahler forest vegetation affected environment (Table 3-8). Because stand density varies by biophysical environment, the HRV analysis was stratified by potential vegetation group: dry upland forest (app. 26,980 acres). Note that Moist Upland Forest PVG is not included because it has too few acres for a credible HRV analysis. The entire affected environment is included in table 14 except for nonforest (3,840 acres) and the Moist UF PVG (300 acres).

Stand density class is used as an indicator for the stand density measure. The information presented in table 14 suggests that the high stand density class is currently over-represented on Dry UF PVG sites because it exceeds the upper limit of its historical range of variation. The low stand density class is under-represented because it is below the lower limit of its historical range of variation. The moderate stand density class occurs within its historical range, so the current representation of moderate stand density in the Kahler planning area is appropriate for Dry UF PVG sites.

**Table 3-14: HRV analysis for stand density classes of the Kahler forest vegetation affected environment**

| | DRY UPLAND FOREST PVG | | | |
|---|---|---|---|---|
| | Historical Range | | Existing Amount | |
| Stand Density Class | Percent | Acres | Percent | Acres |
| Low | 40-85 | 10,800-22,950 | 38 | 10,190 |
| Moderate | 15-30 | 4,050-8,100 | 17 | 4,520 |
| High | 5-15 | 1,350-4,050 | 45 | 12,270 |
| Total | | | 100 | 26,980 |

***Notes:* Existing amounts are taken from the Kahler vegetation database. Gray shading indicates stand density classes that are either above or below the historical range of variation. Historical ranges were taken from Martin (2010). This analysis includes unsuitable NFS lands included in the Kahler proposed action (see table 6, footnote 2). This analysis does not include Dry UF acreage located outside of the affected environment but within the Kahler planning area, or Moist UF PVG or nonforest acreage.**

### Fuels

## Affected Environment

The Kahler area has seen an interruption in the natural fire disturbance regime in which it evolved. This has created changes in species composition, stand structure, density and fuel loads. As a result, the existing levels of fire severity (low, moderate, stand replacement) are out of their historic proportion to each other. Fewer acres are burning at low intensities and more acres have burned, or are projected to burn, at moderate to high intensities (greater than four foot flame lengths).

Forest Plan management areas that are unsuitable for prescribed fire (D2 Research Natural Area, 84 acres) are not included in the affected environment for the fire and fuels analyses. Private land within and adjacent to the planning area were also not included in the affected environment.

Fire occurrence and fuels information on private property was not available and therefore not included in this analysis.

See Fire and Fuels Report for maps and figures of the project area, WUI, and Community Protection Plan.

## Existing Condition

Prior to Euro-American settlement, dry ponderosa pine and mixed conifer forests were burned by frequent low- or mixed-severity fires. These mostly surface fires maintained low and variable tree densities, light and patchy ground fuels, simplified forest structure, and favored fire-tolerant trees, such as ponderosa pine, and a low and patchy cover of associated fire-tolerant shrubs and herbs (Hessburg, P; Agee, J; Franklin, J 2005).

### Historical Range and Variability

See Fire and Fuels Report (page 7) for discussion of HRV, fire regime, fire behavior, and fire type. These sections describe the vegetation composition historically found in the Kahler planning area, and descriptions of fire regime, behavior, and type.

### Tamarack Lookout and Rental Cabin

Constructed circa 1934, Tamarack Lookout serves as a critical fire detection structure for the Umatilla and adjacent National Forests, Bureau of Land Management, Oregon Department of Forestry, and private land owners. Currently Tamarack Lookout (see Figure 11), a rental cabin, and a communication site (National Forest, Oregon Department of Forestry, and Oregon State Police) are at risk of loss from wildfire due to stand encroachment surrounding the site. Heavy fuel loads adjacent to the site contribute to fire risk. A continuous canopy layer surrounds the structures and tree heights obscure detection capabilities. See Fire and Fuels Report for photo of the Tamarack Lookout and communication site (page 19).

## Desired Condition

The objective of the Kahler Dry Forest Restoration Project is to restore vegetation conditions and disturbance regimes to an extent where species composition and structure are functioning within their historical range. The Land and Resource Management Plan for the Umatilla National Forest (the Forest Plan) describes the acceptable fuel loading in tons/acre for each management area in the Kahler planning area. For further information on fire and fuels goals as they pertain to the Forest Plan refer to the Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans section in this report.

For fire-adapted ecosystems to function in the future, multiple treatments over time will be imperative. In a 2012 study on the ecological effects of fuel reduction treatments, results showed that single entry mechanical treatments did not serve as surrogates for fire. Rather, restoration to pre-settlement conditions required repeated treatment over time (McIver, J. et al). The combination of thinning and burning shift diameter distributions toward larger trees; however, no single entry will mitigate the history of fire exclusion and fuel accumulation in dry coniferous forests (Youngblood 2010). Therefore, multiple prescribed fire entries every 10 to 15 years post-treatment is recommended to maintain the Kahler analysis area. In doing so, stand densities may be better managed and fire tolerant species would be favored. This would allow for a more fire resistant forest over the long term.

## Issues Addressed and Indicators for Assessing Effects

Fire Regime Condition Class (FRCC), fuel loading, and potential fire behavior are used as indicators for fire and fuel conditions. In addition, three indicators are used to characterize the environmental consequences of implementing the silvicultural and fuels activities associated with each of the alternatives: species composition (forest cover types), forest structural stages, and stand density classes, as they pertain to HRV in the Dry UF PVG. For more information on HRV as an indicator, refer to the Environmental Consequences and Resource Indicators and Measures and the Alternatives sections of the Kahler Vegetation Report (Powell 2014).

## Methodology

The Kahler forest vegetation analyses utilized a variety of information sources. Some of the vegetation characterizations were derived by using complicated processes such as MSN imputation procedures and FVS post processors. For this reason, the methodologies, modeling, and procedures employed during creation of forest vegetation databases are described in a separate specialist report (Justice 2014). The area was modeled for commercial thinning (2015), piling, burning piles, and landscape underburning (2020). It was not modeled for underburn treatments every 10-15 years after treatment (beginning 2035), as recommended by this report because that would be beyond the scope of the project.

FireFamilyPlus 4.0 was used to determine weather conditions for moderate and extreme scenarios. All weather data came from the Tupper Remote Automated Weather Station located on the Umatilla National Forest, Heppner Ranger District.

BehavePLUS 5 was used to provide fire behavior information for the non-forest vegetation sites. Sites were assigned a fuel model 2 based on expert opinion, GIS analysis and field reconnaissance. The same weather parameters were used in the Behave calculations as were used in FVS for the forested sites.

ArcGIS 10.1, Microsoft Access and Excel were used for all maps and data interpretation. ArcGIS was used to determine fire history and occurrence.

FRCC Software Application 3.0.3.0 was used to determine the appropriate Fire Regime and Condition Class rating for Kahler vegetation. Expert opinion, past fire and silvicultural activity data from the GIS database, and the Blue Mountain fire regime (Powell 2011; Justice 2014) were used to develop the Condition Class rating.

Years 2015, 2021, and 2065 are used in all alternatives to make comparisons and highlight differences between alternatives.

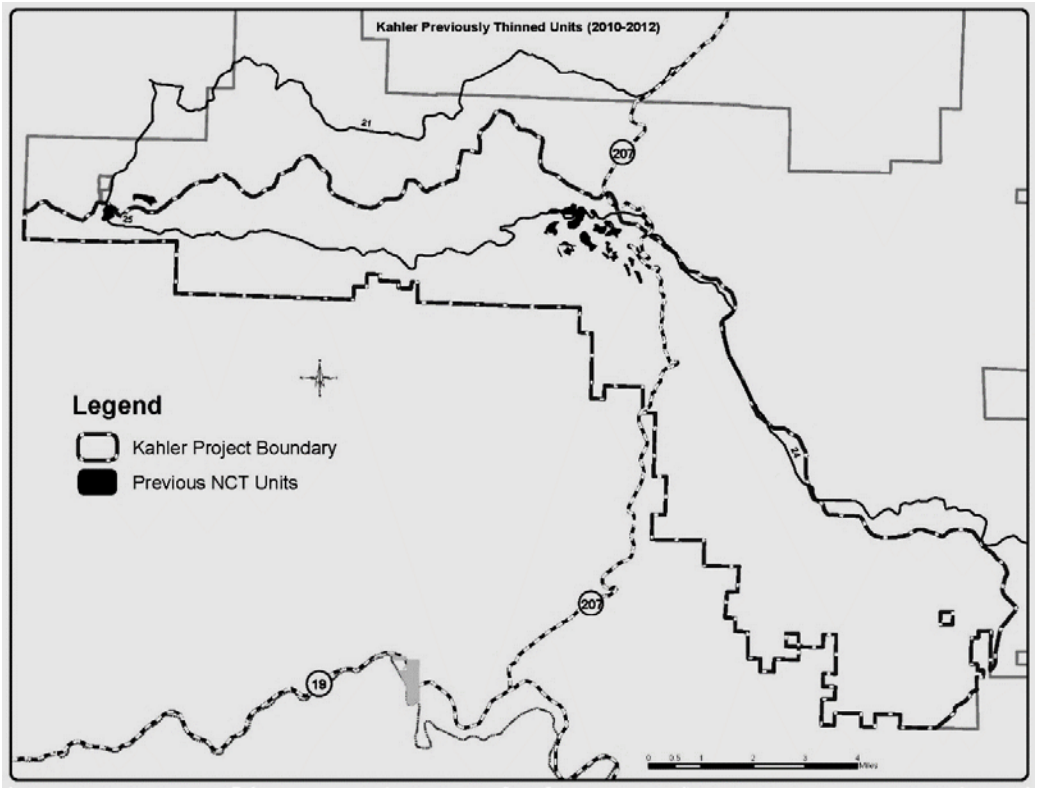
### Spatial and Temporal Context for Effects Analysis

Upon implementation, silvicultural activities included in alternative 2 (proposed action) would directly affect approximately 16,255 acres of the affected environment; fuels activities would affect approximately 31,000 acres for landscape burning (Figure 3-1). It is estimated that 50-70% of the acres proposed in the landscape underburn will have direct effects from fire.

Upon implementation, silvicultural activities included in alternative 3 would directly affect approximately 15,200 acres of the affected environment; fuels activities would affect approximately 31,000 acres for landscape burning (Figure 3-1). It is estimated that 50-70% of the acres proposed in the landscape underburn will have direct effects from prescribed fire.

The timeframe for cumulative effects analysis for the affected environment is a 50-year period because this period adequately reflects the response of species composition, forest structure, and stand density to silvicultural and fuels manipulations (Powell 2014).

Two present actions could directly affect forest vegetation conditions in the Kahler planning area: (1) a District-wide noncommercial thinning project authorized by categorical exclusion (Decision Memo) in 2009, and (2) the Long Prairie Fuels Reduction project (Figure 3-1). Both of the ongoing actions involve noncommercial thinning activities designed to increase residual tree vigor, address dwarf-mistletoe and other insect or disease issues, and reduce ladder fuels. The cumulative effects analysis also explicitly considers direct and indirect effects expected from implementation of silvicultural activities included in Kahler alternatives 2 or 3.



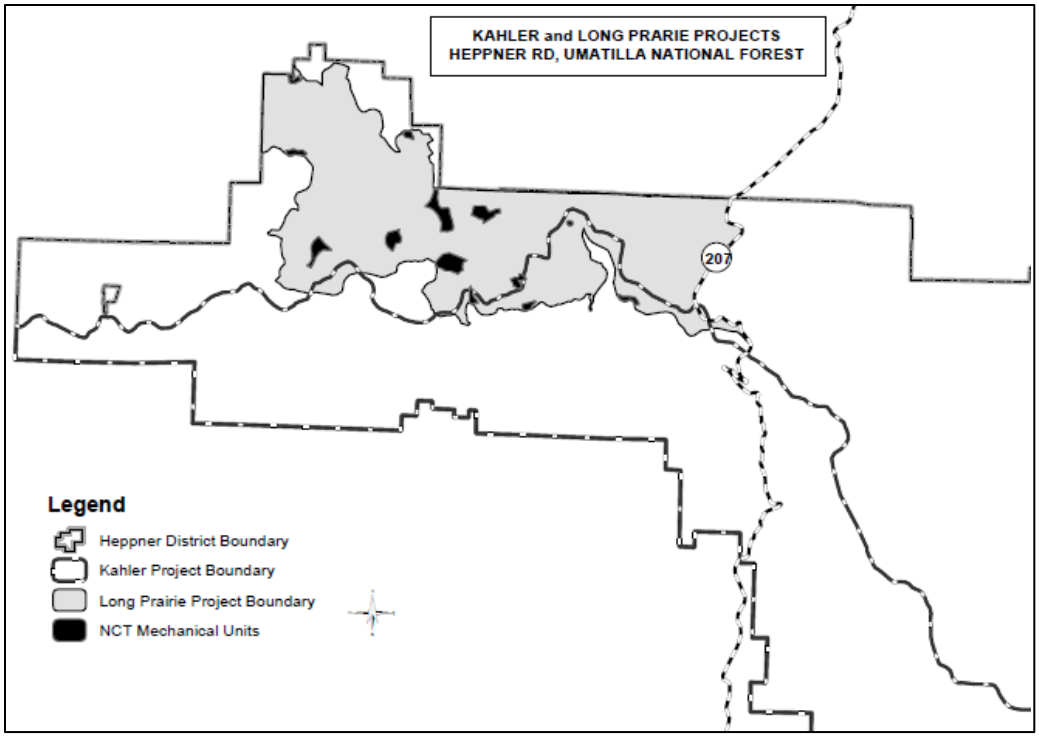



**Figure 3-1 Present (on going) actions in the Kahler planning area- non-commercial thinning authorized by 2009 categorical exclusion (CE) (top) and the Long Prairie fuels reduction project authorized by CE in 2010 (bottom).**

## Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis

For the purpose of evaluating environmental effects, this report considers past, present, and reasonably foreseeable actions in the Kahler planning area, as described below. Future vegetation conditions incorporate direct and indirect effects from three sources: (1) implementation of proposed activities included in Kahler action alternatives (alternatives 2 and 3); (2) present (ongoing) activities; and (3) implementation of reasonably foreseeable actions. The timeframe for cumulative effects analysis is a 50-year period because this period adequately reflects the response of species composition, forest structure, and stand density to silvicultural and fuels manipulations. (Powell 2014)

Past actions influenced existing conditions in the planning area. A database was developed by using Most Similar Neighbor imputation procedures to characterize existing vegetation conditions (Justice 2014). Existing conditions are current as of 2012, reflecting stand exams completed during 2010 and 2011, compilation of a vegetation database in late 2011 (by using MSN), and field validation of vegetation information during 2011 and 2012. Existing conditions reflect the historical influence of wildfire, insect and disease activity, timber harvest, noncommercial thinning, tree planning, grazing, and other non-silviculture changes.

Present (ongoing) actions were considered when evaluating cumulative effects. Two present actions could potentially affect forest vegetation conditions in the Kahler planning area: (1) a District-wide noncommercial thinning project authorized by categorical exclusion (Decision Memo) in 2009, and (2) the Long Prairie Fuels Reduction project (Figure 3-1). Both of the ongoing actions involve noncommercial thinning activities designed to increase residual tree vigor, address dwarf-mistletoe and other insect or disease issues, and reduce ladder fuels. The

cumulative effects analysis also explicitly considers direct and indirect effects expected from implementation of activities included in Kahler alternatives 2 or 3. The noncommercial thinning and prescribed fire treatments authorized by CE represent incremental actions that, in my judgment, are fully responsive to the Kahler project's purpose and need.

Fire suppression and grazing are on-going activities in the Kahler area. Grazing temporarily reduces fine fuel loads in palatable grasses. Fire suppression allows fine dead fuel loading to increase slightly over time, until they decay naturally or are consumed by fire. Both fire suppression and grazing affect condition class by allowing fire intolerant species to establish, increase stand density, increase canopy bulk density, and lower canopy base height. This, in turn, increases fire intensity which has a direct effect of fire suppression capabilities and resistance to control.

Reasonably foreseeable actions were considered for the cumulative effects analysis. Actions are considered to be reasonably foreseeable if Forest Service planning activities (scoping, etc.) have been initiated for them. Based on a review of the Forest's SOPA, no reasonably foreseeable actions potentially affecting vegetation conditions in the Kahler planning area are anticipated over the next 5 years.

# Air Quality

The analysis area for air quality impacts includes sensitive areas that may be affected by smoke intrusion from prescribed burning activities in the Kahler Dry Forest Restoration Planning Area. These areas may include:

- Sensitive area--Winlock two miles southwest of Kahler planning area
- Sensitive area--Spray (population 160) five miles southwest of Kahler planning area
- Sensitive area--Monument (population 125) five miles southeast of Kahler planning area
- A4 Viewshed 2 (900 acres within the Kahler project area) along State Highway 207
- A6 Developed Recreation (Fairview Campground; Tamarack Rental Cabin)

The areas designated as sensitive are listed due to their proximity to the project area and/or location in alignment of general wind patterns in the area.

The communities of Winlock and Monument are identified as Communities at Risk within the County Wildfire Protection Plan (CWPP) identified boundaries of the Wildland Urban Interface (WUI) adjacent to the Kahler project area. The communities are primarily defined as an Intermix Community where structures are scattered throughout a wildland area; they can either be clustered close together or spread out to one structure per 40 acres.

See Air Quality Report for maps and figures denoting WUI Zones in Grant and Wheeler Counties.

## Existing Condition

Prior to Euro-American settlement, dry ponderosa pine and mixed conifer forests were burned by frequent low- or mixed-severity fires. These mostly surface fires maintained low and variable tree densities, light and patchy ground fuels, simplified forest structure, and favored fire-tolerant trees, such as ponderosa pine, and a low and patchy cover of associated fire-tolerant shrubs and herbs (Hessburg, P; Agee, J; Franklin, J 2005). The Kahler area has seen an interruption in the natural fire disturbance regime in which it evolved. This has created changes in species

composition, stand structure, density and fuel loads. As a result, the existing levels of fire severity (low, moderate, stand replacement) are out of their historic proportion to each other. Fewer acres are burning at low intensities and more acres have burned, or are projected to burn, at moderate to high intensities (greater than four foot flame lengths).

### Desired Condition

The desired future condition of the Kahler Dry Forest Restoration Project is to restore vegetation conditions and disturbance regimes where species composition and structure are functioning within their historical range. The Land and Resource Management Plan for the Umatilla National Forest (the Forest Plan) describes the acceptable fuel loading in tons/acre for each management area in the Kahler planning area. Air quality protection will be achieved by complying with Forest-wide Standards and Guidelines. The Forest will comply with state and local regulations and guidelines directed at preventing and controlling air pollution.

## Botanical resources

### Methodology

Botanical resources refer to those vascular or non-vascular taxa that have been assigned special status as either Threatened or Endangered via federal Endangered Species Act (ESA) designation, as sensitive on the Forester's Special Status Species List (RFSSSL), updated in December 2011, or perceived as rare by the botanical specialist.

### Existing Conditions

The Kahler Project area encompasses a broad area of the Heppner Ranger District of the Umatilla National Forest comprising in total approximately 14,000 acres. This dry forest area is comprised predominately of coniferous forest characterized by plant associations in the Douglas fir, ponderosa pine and western juniper series with some subordinate xeric to mesic-moist members of the grand fir plant association group. Some occurrences of xeric shrubland/grassland plant associations are also present. Table 3 below presents the plant associations that were identified within the Kahler Project while conducting on-the-ground surveys during the 2012 and 2013 field seasons.

The area encompassed by the Kahler Project has departed significantly relative to historical conditions in the pre-settlement era. As indicated by early photographs and records from the general region in similar settings most of the general area was open ponderosa pine woodland with old-growth early seral species the dominant coniferous presence. The advent of aggressive fire suppression policies, late 19$^{th}$ and early 20$^{th}$ century unregulated grazing practices, and vegetation changes associated with trophic cascade effects (e.g. increases in ungulate populations and attendant browsing) related to the loss of top predator species much/most of the Kahler Project has been strongly modified, and non-native vascular plant taxa are common to ecologically dominant in some settings – particularly in shrubland and grasslands.

Historically, frequent low intensity fires kept understory vegetation composition dominated by grasses and forbs with lesser shrub and conifer regeneration components. Conversely, at the present time much of the Kahler Project is comprised of significantly overstocked forested areas (see Figure 1 of Botanical Resource Report). While it is not sufficiently documented owing to a paucity of botanical collections and community composition records from the 19$^{th}$ and early 20$^{th}$ century, it can be inferred that overall vascular plant species richness within the Kahler Project is at present reduced relative to historical levels. Conversely, a subset of native taxa with low

occurrence levels historically may now enjoy a higher frequency/abundance. Amongst these taxa are species that are highly shade tolerant such as members of the genus *Pyrola*, three species of orchids in the genus *Coralorhiza*, the showy orchid *Cypripedium montanum* (mountain lady's slipper), *Viola orbiculata* (darkwoods violet), *Bromus vulgaris* (Columbia brome), and *Chimaphila menziesii* (little prince's pine).

### Project Design Features

Areas to protect will be implemented at 3 rare plant population locations in units 14 and 22. Both of these units are proposed for ground-based commercial thinning in Alternatives 2 and 3. These ATPs are buffered (30 m) rare plant populations.

These areas to protect shall be excluded from ground-disturbing treatments by implementing a no-ground-disturbance buffer around each site of a size adequate to provide protection from implementation impacts. All off-road vehicles, trucks, and equipment shall avoid operation and travel in these areas. Decking, yarding, and piling of slash shall not occur in these areas. Camps and staging areas shall not be allowed. Fire control lines shall not be constructed in these areas. Each buffer size will be determined based on the site-specific setting of the occurrence, although the customary minimum is 30 meters. If it is determined to be necessary for project implementation, these areas will be identified (flagged) on the ground. 'Areas to protect' will be specified in timber sale contract maps. Trees will be directionally felled away from these 'areas to protect.'

If any new rare plant populations are located before or during project implementation, a Forest Service Botanist will be notified. The population will be evaluated and design criteria shall be developed in consultation with the botanist.

The proposed Henry Creek Botanical Area is another designated "area to protect" in unit 14 with a small portion in unit 12. Both units are proposed for ground-based commercial thinning and these areas to protect includes the same design criteria as stated for 'areas to protect' in narrative above.

Prescribed fire will be kept away from the Kahler Creek Butte proposed Research Natural Area by spring back-burning in Idaho fescue plant communities bordering the Research Natural Area creating a black line where possible and practical.

See Botanical Resource Report for plant associations, figures showing the vegetation found within the Kahler Project area, rare plant list, Henry Creek Proposed Botanical Area, and the . Kahler Creek Butte proposed Research Natural Area.

## Affected Environment

## Existing Conditions

The Kahler Project area encompasses a broad area of the Heppner Ranger District of the Umatilla National Forest comprising in total approximately 31,000 acres. This dry forest area is comprised predominately of coniferous forest characterized by plant associations in the Douglas fir, ponderosa pine and western juniper series with some subordinate xeric to mesic-moist members of the grand fir plant series. Some occurrences of xeric shrubland/grassland plant associations are also present. Table 3 below presents the plant associations that were identified within the Kahler Project area while conducting on-the-ground surveys during the 2012 and 2013 field seasons.

The area encompassed by the Kahler Project has departed significantly relative to historical conditions in the pre-settlement era. As indicated by early photographs and records from the general region in similar settings most of the general area was open ponderosa pine woodland with old-growth early seral species the dominant coniferous presence. The advent of aggressive fire suppression policies, late 19th and early 20th century unregulated grazing practices, and vegetation changes associated with trophic cascade effects (e.g. increases in ungulate populations and attendant browsing) related to the loss of top predator species much/most of the Kahler Project area has been strongly modified, and non-native vascular plant taxa are common to ecologically dominant in some settings – particularly in shrubland and grasslands.

Historically, frequent low intensity fires kept understory vegetation composition dominated by grasses and forbs with lesser shrub and conifer regeneration components. Conversely, at the present time much of the Kahler Project is comprised of significantly overstocked forested areas (see Figure 1 of Botanical Resource Report). While it is not sufficiently documented owing to a paucity of botanical collections and community composition records from the 19th and early 20th century, it can be inferred that overall vascular plant species richness within the Kahler Project area is at present reduced relative to historical levels. Conversely, a subset of native taxa with low occurrence levels historically may now enjoy a higher frequency/abundance. Amongst these taxa are species that are highly shade tolerant such as members of the genus *Pyrola*, three species of orchids in the genus *Coralorhiza*, the showy orchid *Cypripedium montanum* (mountain lady's slipper), *Viola orbiculata* (darkwoods violet), *Bromus vulgaris* (Columbia brome), and *Chimaphila menziesii* (little prince's pine).

# Invasive Plants

### Scale of Analysis

The analysis area for evaluating existing invasive plant populations is consistent with the Kahler analysis area. Invasive plant infestations used in the analysis are only those sites located within project area. This analysis will then focus on those sites located in the specific activity areas as well as preventing invasive plant establishment.

### Methodology and Assumptions

Invasive plants, as defined by the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, are non-native plants whose introduction does or is likely to cause economic or environmental harm or harm to human health. This analysis will focus on those species that are listed on the Oregon Department of Agriculture noxious weed list. "Invasive species", "invasive plants", and "noxious weeds" will be used interchangeably in this document.

Invasive plants will be discussed based on inventoried weed sites as well as known weed species that occur in the analysis area that are not inventoried. Known noxious weed sites, soil disturbance, and the potential spread of invasive plants will be the foundation of the analysis. In rating the priority of noxious weeds for treatment and inventory, the Forest classification will be used.

This analysis is tiered to a broader scale analysis (the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, hereby referred to as the R6 FEIS 2005). The R6 FEIS 2005 culminated in a Record of Decision (R6 2005 ROD) that amended the Umatilla National Forest Plan by adding management direction relative to invasive

plants. This project is intended to comply with the new management direction. The portions applicable to the Kahler project area include the prevention standards that are detailed in Appendix A of the Invasive Plant Report.

The Umatilla National Forest Invasive Plants Treatment Project Record of Decision was signed on July 7th, 2010. All of the existing noxious weed infestations within the Kahler Project area are covered under this analysis and have proposed herbicide treatments for the high priority weed species.

## Affected Environment

Noxious weeds of concern within the Kahler project area and their associated priority category are shown in Table 3-15. Several categories are used to prioritize noxious weed species on the Forest list for treating and inventorying:

1. "Potential Invaders" are noxious weed species that occur on lands adjacent to the Umatilla National Forest but which have not been documented on lands administered by the Forest;

2. "New Invaders" are noxious weed species that occur sporadically on the Umatilla National Forest and which may be controlled by early treatment. This category has been split into two subcategories due to changes in weed populations on the Forest:

    a. “New Invaders” are of limited distribution and can probably be eradicated if early treatment can be implemented.

    b. “New Invaders/Established are those species that are presently controllable but which are approaching “Established” and which are prioritized for early treatment.

3. "Established" species are widespread across the Forest in large populations and containment strategies are used to prevent their further spread.

**Table 3-15 Noxious Weed Species and Priority**

| Species | Common Name | Priority |
|---|---|---|
| *Centaurea diffusa* | Diffuse knapweed | New Invader/ Established |
| *Centaurea biebersteinii* | Spotted knapweed | New Invader/Established |
| *Hypericum perforatum* | St. Johnswort | Established |
| *Cirsium arvense* | Canada thistle | Established |
| *Cirsium vulgare* | Bull thistle | Established |
| *Cymoglossum officinale* | Houndstongue | New Invader |
| *Linaria dalatica* | Dalmation Toadflax | New Invader |
| *Taeniatherum caput-medusae* | Medusa-head | New Invader |
| *Cytisus scoparius* | Scotch broom | New Invader |

**Table 3-16 Current Weed Presence**

| Species Code | Common Name | Number of Sites | Avg. Plants/Acre | Acres |
|---|---|---|---|---|
| *Centaurea diffusa* | Diffuse Knapweed | 119 | 10-20+ | 319 |
| *Cymoglossum officinale* | Houndstongue | 1 | 20+ | .5 |
| *Linaria dalatica* | Dalmation Toadflax | 61 | 100+ | 204 |
| *Hypericum perforatum* | St. Johnswort | 74 | 100+ | 220 |
| *Cytisus scoparius* | Scotch broom | 4 | 10-30 | 22 |

**Spotted and Diffuse Knapweed—**There are 119 sites identified within the project area. Most sites are small with 10-30 individual plants. There are 319 acres identified within the project area that Spotted and Diffuse Knapweed have been identified on. Most of these sites are along existing roads within the project area. Sites that are currently inventoried and are cleared for treatment are being treated manually or treated with herbicides. Treatments will continue to occur at these sites. Manual treatments will be primarily used to treat these small infestations of less than 20 plants. Herbicide treatments may occur if needed on larger sites. Preventing vehicles from spreading knapweed seed into the project area and analysis area would decrease the potential spread and establishment of knapweed.

**Dalmatian Toadflax--**There are 61 Dalmatian toadflax sites identified within the project area. There are approximately 200 acres of Dalmatian Toadflax that has been inventoried within the project area. Most sites are small with concentrations of 10-100+ plants. In 2005 the biological control agent (*Mecinus janthinus*) Toadflax stem weevil, was released on identified sites on the south end of the district. This agent has been very effective at reducing the number of flowering plants annually. Dalmatian Toadflax appears to establish in harsh sites as well as areas with good soil characteristics and aspect. This species prefers well drained to gravelly soils, through which it spreads by an extensive underground root system. It reproduces both by seed and by sprouting from buds on the roots. Because of their waxy leaves and deep root systems these plants are difficult to control with herbicides. Their capacity to re-sprout from root remnants also makes control by hand-pulling or mechanical means impractical.

**Houndstongue—**There is 1 inventoried site of houndstongue that has been identified within the project area. This site is approximately .5 acre and there has been anywhere from 10-30 plants annually. It is important to inventory and treat this site before the plants go to seed to reduce the potential of spread. Treatments that have been effective at reducing plants on this site consists of manual and herbicide use. This noxious weed has the potential to spread because of the burr seed that is produced. It is easily transported in fur of domestic and wild animals and in clothing.

**Scotch Broom—**There are 4 Scotch Broom sites that have been identified within the project area. There are approximately 20 acres of Scotch Broom that have been identified with in the project area. The average number of plants that have been identified in these four sites is 10-30 plants. Scotch Broom has not been a real threat and it does not spread very fast in a dry forest climate. Manual and Chemical treatments have been effective at reducing the spread of this noxious weed within the project area.

**Medusahead--** has been inventoried at the forest boundary and in small areas along arterial roads within the analysis area. This annual grass is more prevalent on adjacent private lands within the Kahler Basin area. This noxious weed has the potential to spread rapidly with disturbance to the landscape.

**Low Priority Noxious Weeds**--Three low priority "established" weeds, Canada thistle, Bull thistle, and St. Johnswort, are fairly widespread within the analysis area and are so extensive Forest-wide that they are not generally inventoried. St. Johnswort and bull thistle are less invasive and/or persistent than the high priority weeds and generally give way to or do not out-compete desirable vegetation. It can be assumed that these three weed species can be found throughout the analysis area.

Low priority weed species, such as Canada thistle, Bull thistle, and St. Johnswort, also readily establish where soil and plant associations have been disturbed. Biological control agents are present on Canada thistle and St. Johnswort in the analysis area; however, success is not known at this time.

# Wildlife

### Scale of Analysis

The scale of the analysis differs based on the species and habitats being considered. For this evaluation and analysis, the term "analysis area" generally (see exception below for snag analysis area) refers to Umatilla National Forest lands within the Alder Creek, Lower Kahler Creek, Upper Kahler Creek, Haystack Creek, and Bologna Canyon subwatersheds, an area of approximately 32,900 acres. "Project area" refers to all the affected areas where the proposed project would occur on the landscape. "Affected area" is the stand or portion of a stand (unit) where a specific action or activity would occur. Unless noted, the scale of analysis for direct and indirect effects and cumulative effects is the same. Temporal bounding of cumulative effects generally extends into the past 40 years, although activities occurring even further in the past that are still having residual impacts today are also considered in the cumulative effects analyses, where applicable. Accurate information regarding harvest activities and other ground disturbing activities is generally available from this point forward. The scale of analysis for assessing impacts to wildlife species and habitats will be as follows:

- Late and old structure, old growth habitat, and habitat connectivity are assessed at the scale of the five subwatersheds that lie within the proposed project area (Kahler Creek-John Day River watershed), with consideration given to the connectivity of late and old structure habitat and old growth to habitats outside the boundaries of the analysis area. The analysis area for the HRV analysis includes approximately 27,000 acres of National Forest System lands in the immediate vicinity of the Kahler project area.
- Snags are assessed at the scale of the Kahler Creek-John Day River, Upper Rock Creek, and Wall Creek watersheds, combined (approximately 503,300 acres, of which approximately 142,200 acres occur on National Forest System lands) for the Ponderosa Pine/Douglas-fir and Eastside Mixed Conifer-Eastern Cascade/Blue Mountains DecAID habitat types. These features are also assessed at the scale of individual treatment units. The primary cavity excavator group (a Management Indicator Species on the Umatilla) is also assessed at this scale. The viability of this group is assessed at the Forest scale.
- Downed wood is assessed at the scale of the Kahler Creek-John Day River, Upper Rock Creek, and Wall Creek watersheds for the dry upland and moist upland forest Potential Vegetation Groups (PVGs). These features are also assessed at the scale of individual treatment units within the project area.
- The scale of analysis for the Rocky Mountain elk varies depending on standards and direction given by the Forest Plan. In the E1 Management Area, the scale of analysis is the management area allocation lying within each subwatershed represented within the project area (where treatment activities occur). For the C3 management area, the

analysis area is all NFS lands within each individual winter range. The minimum analysis area size is 5,000 acres. Viability of this species is assessed at the Forest scale. Refer to the Rocky Mountain Elk section for further clarification.

- Potential effects on the pileated woodpecker are assessed at the watershed and larger dead wood analysis area, with respect to snag habitat. Viability of this species is assessed at the Forest scale.
- The American marten is assessed at the watershed scale, with respect to effects to source habitat. Viability of this species is assessed at the Forest scale.
- The scale of analysis for Endangered, Threatened, and Sensitive species, including the Columbia spotted frog, Johnson's hairstreak butterfly, intermountain sulphur butterfly, Lewis' woodpecker, white-headed woodpecker, and gray wolf, is suitable/potential habitat on National Forest System lands within the Kahler Creek-John Day River watershed.
- The scale of analysis for the northern goshawk is suitable habitat within the watershed.
- Neotropical Migratory Birds are assessed at the watershed scale; specific habitat types and features are addressed at this scale.

Suitable/source habitat for species included in this wildlife analysis was identified during field reconnaissance and by using the vegetation database for the Heppner Ranger District. Vegetation data was queried based on habitat requirements and preferences of selected species, based on the best information available. Suitable habitat queried from GIS was then intersected with proposed treatment units in the Kahler project area. Queries used to identify potential wildlife habitats are available in the Kahler project file at the Heppner Ranger District office. For the purposes of this report, the short term would include immediate impacts and those that last up to 5 years from implementation. The mid-term would include impacts lasting from 5 to 15 years; the long term would apply to impacts that occur or changes that develop in 15 years or longer.

## Affected Environment

### Dedicated Old Growth Habitat

Old growth units are identified in the Forest Plan as Management Area C1 (Dedicated Old Growth) and Management Area C2 (Managed Old Growth). The goal of this management area is to protect sufficient suitable habitat for wildlife species dependent upon mature and/or overmature forest stands, and promote a diversity of vegetative conditions for such species (USDA 1990, pg 4-144). Unit size and distribution are variable and depend on the vegetation type and the Management Indicator Species (MIS) for which the unit was designated. Old growth units were initially classified as suitable and/or capable habitat for a selected Forest indicator species (pileated woodpecker or American marten in the case of C1; American three-toed woodpecker for C2). For pileated woodpecker, minimum unit size is generally 300 acres; for American marten, 160 acres; and 75 acres for American three-toed woodpecker. Units can occur in smaller (50 acre minimum) blocks no more than ¼ mile apart. Timber management and harvest activities are generally not permitted in the C1 management area; salvage of dead wood is permitted if old growth units are lost as a result of a catastrophic event. Reconstruction and construction of new roads and trails is permitted in the C1 management area, but would be limited to the number and miles necessary to meet surrounding area objectives.

There are no C2 old growth habitat units within the analysis area. There are all or portions of 5 C1 stands within the Kahler Analysis Area. The Umatilla National Forest Land and Resource Management Plan (USDA 1990, pg. 4-56) provides standards and guidelines for the size and

spacing of Dedicated Old Growth (DOG) stands. In general, the old growth unit is comprised of ponderosa pine and Douglas-fir; pockets of dense grand fir are present in some areas. DOG unit 1871 burned at high severity in the Wheeler Point Fire in 1996. As it was lost to a catastrophic disturbance event, it was subsequently salvaged and a replacement old growth unit identified. The Forest Plan was amended to move the replacement from the E1 to the C1 management area. This replacement old growth unit (DOG 1971) is approximately 310 acres, of which 214 acres is within the Kahler project area. These C1 old growth units total approximately 1,600 acres. All of these stands would be considered suitable or capable pileated woodpecker habitat, with the exception of the stand that burned in the Wheeler Point Fire. As a result of multiple factors including wild fire, past harvest, and the natural growing potential of dry upland forest, the landscape in the vicinity of the DOGs within the Kahler analysis area is fragmented, and contributes to generally poor old growth connectivity in portions of the analysis area. Under the Kahler EIS, vegetative treatment is proposed in DOG 1841 adjacent to Tamarack Lookout to protect infrastructure at the site (lookout, communication equipment, and Tamarack Cabin) from wildfire and other disturbance, and to clear/improve sight lines from the lookout that are currently blocked by overstory vegetation. The 3 acres (of which less than one acre is within the C1) immediately adjacent to the tower would be very open after treatment; the remaining 11 acres lying within the existing C1 stand would be thinned to a lesser degree, with emphasis on clearing sight lines. Some trees >21 inches DBH may be topped to clear sight lines from the tower. As it would be desirable to maintain the area adjacent to the lookout to reduce the risk of damage by disturbance and retain clear sight lines, a replacement for these acres is proposed north of the existing old growth stand. This replacement would be 16 acres in size, would be connected to the existing old growth area, and would provide similar habitat as those acres that would move from the C1 to the E1 management area allocation. Old growth habitat surveys were conducted in the replacement area on July 8, 2014.

### Late and Old Structural Stages

The wildlife standards in the Regional Forester's Forest Plan Amendment #2 (USDA 1995) require the evaluation of late and old structural stages relative to the quantity of late and old structural stages that occurred on the landscape historically. For the purpose of this standard, late and old structural stages include old forest multi-strata (OFMS) and old forest single-stratum (OFSS) stands. While only structure is considered here for the purposes of identifying late and old structure habitat, a number of other factors actually affect the quality and effectiveness of these stands for providing habitat to late and old structure associated wildlife species. These factors include large diameter tress, large diameter snags and downed wood, stand complexity/heterogeneity, and trees with broken tops, decay/hollows (resulting from disease or other factors), wind/ice/fire damage, mistletoe brooms, and other features indicative of decadence. A number of species present on the Umatilla National Forest require late and old structure habitat. These species include pileated woodpecker, white-headed woodpecker, Lewis' woodpecker, pine marten, northern goshawk, Cooper's hawk, sharp-shinned hawk, flammulated owl, great gray owl, Vaux's swift, Townsend's warbler, Hammond's flycatcher, and others.

The historical range of variability (HRV) and existing old forest habitat in each potential vegetation group (PVG) in the Kahler project area is shown on Table W-01. The appropriate analysis area size for an analysis of the HRV is 15,000 to 35,000 acres, although areas larger than 35,000 acres are appropriate and preferable for the HRV analysis (refer to Silviculture Specialist Report). The analysis area for the HRV analysis includes approximately 27,000 acres of NFS lands in the Kahler project area. Analysis of spatial vegetation data in GIS was used to identify the current extent of various structural stages (classified by Potential Vegetation Group - PVG) in the analysis area. The HRV analysis (refer to Silviculture Specialist Report) indicates that within the dry upland forest potential vegetation group, the Kahler project area is currently

well below HRV for the OFSS structural class and above HRV for the OFMS structural class.

**Table 3-17 Historic range of variability (HRV) analysis for late and old forest structural classes in the Kahler Project area (see Silviculture Report).**

| Potential Vegetation Group | Old Forest Multi Strata | | Old Forest Single Stratum | | NFS Acres (Total) |
|---|---|---|---|---|---|
| | Historic Range | Current | Historic Range | Current | |
| Dry Upland Forest | 5-15% | 9% | 40-60% | 6% | 26,980 |

**Dark gray in Table W-01 indicates a structural stage and potential vegetation group currently below HRV.**

The HRV analysis for this project indicates that the dry upland forest habitat type would all fall into Scenario A of the Eastside Screens (Regional Forester's Forest Plan Amendment #2, USDA 1995). The Screens state that there should be no net loss of old forest habitat from these potential vegetation groups. The Regional Forester's Forest Plan Amendment #2 states that harvest is allowed in LOS stages that are above or within HRV in order to maintain or enhance late and old structure habitat within a particular biophysical environment or to move one type of LOS habitat into an LOS stage that is deficit (below HRV). The analysis area used in this Wildlife Specialist's Report for late and old structure habitat includes all Umatilla National Forest lands within the Alder Creek, Lower Kahler Creek, Upper Kahler Creek, Haystack Creek, and Bologna Canyon subwatersheds, an area of approximately 33,000 acres. Currently, there are approximately 4,130 acres of late and old structure habitat within the Kahler analysis area (Forest Vegetation Report).

**Table 3-18 Existing condition of late and old structure habitat in the Kahler LOS analysis area.**

| LOS Structure Type | Existing Habitat (Acres) |
|---|---|
| Old Forest Single Stratum | 1,550 |
| Old Forest Multi-Strata | 2,580 |
| **Total LOS Habitat** | 4,130 |

**These acres were queried from the GIS database using stand structure (old forest single-stratum and old forest multi-strata) to identify late and old structure stands.**

### Connectivity

Wildlife standards in the Regional Forester's Forest Plan Amendment #2 (USDA 1995) require late and old structural stands and designated old growth areas to be connected to each other across the landscape. For this standard, connective habitat does not necessarily need to meet the same description of suitable habitat for a particular species, but provide "free movement" between late and old structural stands and old growth areas for various wildlife species associated with the late and old structural condition. The Regional Forester's Amendment #2 allows for treatment within connectivity habitat as long as certain conditions are met. These conditions include: stands maintain medium and large trees (are "common"), canopy closures are within the upper 1/3 of site potential, connections are at least 400 feet wide (where available), and old growth/LOS are connected in at least two directions. Where these conditions cannot be met, the best available connectivity habitat should be provided.

Connectivity of late and old structure habitat and C1 old growth is poor in portions of the analysis area due to natural openings, vegetative composition, past management activities, and past wildfire. Portions of the analysis area, particularly ridge tops and lower elevation areas, are composed of grasslands and shrublands, including contiguous grasslands, grasslands interspersed with timber, grassy stringers associated with draws, and other non-forest habitat features. As a result, portions of the analysis area have a naturally low potential to provide connectivity to adjacent or distant stands. Connectivity habitat was identified based on stand data (structure, canopy closure, cover type, etc.) in the existing vegetation database. This database was updated with new information gathered in 2013. Stands with the highest canopy closure and complexity were identified to provide the best connections between late and old structure habitat and Forest Plan old growth. Proposed treatment units are present in identified connectivity corridors. Design criteria would be used where proposed units and connectivity corridors overlap to maintain old growth connectivity and to meet the standards provided by the Forest Plan, as amended by the Eastside Screens (USDA 1995).

## Snag Replacement Trees

Snag replacement trees are analyzed to determine the potential for recruitment of dead tree habitat over time across the landscape. Current direction for green tree replacement (GTR) densities are based on the requirements described in the Eastside Screens (USDA 1995), which requires that all sale activities maintain green replacement trees of ≥ 21 inches DBH (or whatever is the representative DBH of the overstory layer if it is less than 21 inches), at 100% potential population levels of primary cavity excavators. For the adjacent North Fork John Day (NFJD) Ranger District, GTR density objectives were quantified in a memo dated March 22, 1996 entitled "Wildlife Tree and Down Wood Guidelines" (USDA 1996). Because stands in the Kahler area are similar to those encountered on the adjacent NFJD Ranger District, the numerical values provided in this memo will be used for the Kahler Project.

**Table 3-19 Green tree replacement objectives (USDA 1996).**

| Tree Size (diam. at breast height) | Plant Association | | | |
|---|---|---|---|---|
| | **Ponderosa Pine** | **Warm Grand Fir** | **Cool Grand Fir** | **Lodgepole Pine** |
| 10-12 inches | 2.0 | 2.0 | 5.6 | 3.0 |
| 12-15 inches | 2.0 | 3.0 | 3.4 | 3.0 |
| 15-20 inches | 3.0 | 5.0 | 5.6 | 0 |
| >20 inches | 1.0 | 2.0 | 1.7 | 0 |
| *Total | 8.0 | 12.0 | 16.3 | 6.0 |

***Division of GTRs by diameter does not preclude the partial or total substitution of larger green trees for smaller ones, although it is recognized that a distribution of size classes will provide for snag replacement over a greater period of time.**

Currently, all of the stands proposed for commercial thinning meet green tree replacement objectives. Burned areas within the analysis area are currently deficient in appropriately sized green tree replacements; however, the majority of burned areas have high densities of small diameter trees that will grow into appropriate size classes and provide for snags in the long term.

## Downed Wood Habitat

The Umatilla Forest Plan (USDA Forest Service 1990) established standards and guidelines for downed wood for various levels of biological potential in each management area. The plan was amended in 1995 by the Regional Forester's Forest Plan Amendment #2, also known as the "Eastside Screens."

For coarse-scale analysis or when fine-scale data is not available, data from Current Vegetation Survey (CVS) plots can be used to estimate average downed wood densities and analyze effects on downed wood. CVS data will be used in this analysis to estimate downed wood densities at the watershed scale to compare with Forest Plan standards. Current Vegetation Survey inventories are permanent plots on a 1.7-mile grid that sample the vegetative condition across National Forest Lands. Plot data was collected on the Umatilla National Forest between 1993 and 1995 and re-measured on selected plots in 1997, 1999, and 2002. At each plot/point, a variety of vegetative information is collected. Data collected includes plant association, live trees, dead trees, and downed wood, with diameters and heights for each species tallied.

Deadwood was tallied for each 2" diameter class in the plot/point then aggregated by potential vegetation group and divided by the number of plot/points to arrive at an average number of deadwood pieces for each size class in a potential vegetation group. Per Forest Plan direction, only downed wood larger than 12 inches in diameter was used to estimate existing downed wood densities in the Dry and Moist Upland Potential Vegetation Groups.

Downed wood density estimates derived from Current Vegetation Survey data are statistically valid at the watershed scale or larger. Current Vegetation Survey estimates of downed wood densities used in this analysis are not statistically valid at smaller scales (project scale) or for a specific site within the watershed. Snags and downed wood tend to occur on the landscape as singles, groups, clumps, patches or piles resulting from natural tree mortality and disturbances, such as fires, insect and disease, ice storms, and drought. These random events result in an uneven distribution of downed wood across the landscape.

Current Forest Plan direction for downed wood densities is based on the Forest Plan (USDA 1990) and direction given in the Eastside Screens (USDA 1995). The Forest's amended guidelines for downed wood densities for the Kahler analysis area are found in Table W-04. As there are few cold upland forest stands in the Kahler Planning Area, and those that are present generally do not contain a preponderance of Engelmann spruce, subalpine fir, and lodgepole pine, these stands will be considered moist upland forest stands for the purposes of this analysis.

**Table 3-20 Forest Plan minimum standards and existing downed wood density in the Kahler analysis area (Kahler Creek-John Day River, Upper Rock Creek, and Wall Creek Watersheds).**

| **Forest Plan Standard (amended 1995)** | | **Forest Plan Downed Wood Criteria (minimum)** | **Kahler Analysis Area (CVS Data)** | |
|---|---|---|---|---|
| **Vegetation Type** | **Down wood Density** | | **Potential Vegetation Group** | **Down wood Density** |
| Ponderosa pine/Douglas-fir | 3-6 pcs/ac | Small end dia. >12 inches<br>Piece length >6 feet<br>Total length 20-40 feet | Dry Upland Forest | 18.4 pcs/ac |
| Mixed conifer/grand fir | 15-20 pcs/ac | Small end dia. >12 inches<br>Piece length >6 feet<br>Total length 100-140 feet | Moist Upland Forest | 54.9 pcs/ac |

When compared to Forest Plan standards (as amended) for downed wood density, current estimates of average downed wood densities exceed the Forest Plan standard for the dry and moist upland forest potential vegetation groups. It should be pointed out that inclusion of the Wall Creek Watershed in the downed wood analysis area resulted in much higher average downed wood densities than those in the Kahler Creek-John Day River and Upper Rock Creek Watersheds. This is likely due to the fact that dry and moist upland stands in portions of the Wall Creek watershed were impacted heavily by spruce budworm in the 1980s and early 1990s, resulting in very high snag densities in these stands. Ongoing fuels treatments under the Wildcat

II EA have reduced these snag and dead wood densities, but are not reflected in CVS data; these plots have not been re-measured since fuels treatment began. Within the analysis area, a wide range of downed wood habitat conditions exists; some stands have very little to no wood, while others have levels much greater than the Forest Plan standard.

Effects to downed wood habitat are assessed at the scale of individual treatment units and the entire Kahler analysis area.

### Management Indicator Species

The Forest Plan designates Management Indicator Species (MIS) to represent larger groups of animals associated with the major habitat types on the Forest. Habitat conditions for management indicator species must be managed to maintain viable populations (USDA 1990, page 2-9) at the Forest or larger scale. MIS species for the Forest are presented in Table 3-15.

**Table 3-21 Umatilla National Forest Management Indicator Species (USDA 1990, page 2-9).**

| Species | Habitat Description | Habitat Present in Analysis Area? | Species Present in Analysis Area? |
|---|---|---|---|
| Rocky Mountain elk | General forest habitat and winter ranges | Yes | Documented |
| Pileated woodpecker | Dead/down tree habitat (mixed conifer) in mature and old growth stands | Yes | Documented |
| American three-toed woodpecker | Dead/down tree habitat (lodgepole pine) in mature and old growth stands | Yes | No |
| American marten | Mature and old growth stands at high elevations | Yes | No |
| Primary Cavity Excavators (PCEs) | Dead/down tree (snag) habitat | Yes | Documented |

Rocky Mountain elk, the pileated woodpecker, and a number of primary cavity excavators are known to occur in the analysis area. There have been no observations of either the marten or the three-toed woodpecker in the analysis area. Marten and three-toed woodpecker source habitat is present within the project area. The Wheeler Point Fire (1996) area at the west end of the project area no longer contains suitable burned habitat for the three-toed woodpecker due to the age of this burn. Although there is limited source habitat in the analysis area, and these small patches are widely scattered, impacts on these species will be analyzed under the Kahler Project.

#### Rocky Mountain Elk

The Rocky Mountain elk was selected as a MIS to be an indicator of general forest habitat and winter ranges. It is assumed that if good habitat is provided for elk and their population is maintained at some desired level, that adequate habitat is also being provided for other species that share similar habitat requirements (USDA 1990, page 2-9). Rocky Mountain elk are distributed throughout the western and eastern portions of the United States, and several Canadian provinces. Populations in the eastern United States are generally smaller and less contiguous than those found in the western United States. Preferred habitat for elk consists of a mixture of forested and non-forested habitat types and a variety of forest structures that provide cover and forage for summer and winter usage (Thomas et al. 1979, USDA 1990). Grasses

constitute the majority of elk diets; however, elk will also utilize forbs, shrubs, lichens, and other vegetation, depending on the season of year and forage availability. Winter range habitat consisting of open grasslands and shrublands at low and mid elevations are required to carry elk through the critical winter period. They are primarily grazers, but also require dense forested stands for security and hiding cover. These stands are used for escaping predators (including humans) and during periods of high disturbance, including hunting seasons. Recent research indicates that roads and off road recreation influence the distribution of big game (Rowland et al. 2004, Rowland et al. 2000, Wisdom et al. 2004). Elk generally avoid roads that are open to motorized traffic. The energy expenditure related to avoidance or fleeing from off road activity and road-related disturbance can be substantial (Cole et al. 1997) and may reduce the body condition of elk and ultimately reduce the probability of surviving the winter (Cook et al. 2004). Elk have been found to avoid high quality habitat in favor of lower quality habitat with limited motorized access (Rowland et al. 2004). A reduction in open road density may decrease daily movements and the size of home ranges; these reductions could lead to energetic benefits that result in increased fat reserves or productivity (Cole et al. 1997).

Calving habitat is largely dependent on the availability of nutritious forage during the calving season (mid-May through mid-June) (Toweill and Thomas 2002). Calving generally occurs on transitional ranges with gentle topography where open foraging areas are adjacent to forested habitat (Toweill and Thomas 2002). Ground cover concealment, often in the form of shrubs, downed wood, or broken terrain, has been suggested by some to be important to elk in calving areas; however, this preference or dependence has not been quantified (Toweill and Thomas 2002).

Threats to elk and elk habitat include human development in elk habitat, loss of critical winter range habitat, overhunting, disease, reduced forage quantity and quality, predation, noxious weeds, and others (Toweill and Thomas (2002). The conservation status of the Rocky Mountain elk was identified at the global, national, and state of Oregon geographical areas by NatureServe; by listing status from Federal and State Threatened and Endangered Species lists and Sensitive Species lists; and by the Oregon Conservation Strategy.

See Terrestrial Wildlife Specialist's Report for more information on the Rocky Mountain Elk affected environment, including conservation status, conditions of habitat, road densities, and more.

### Primary Cavity Excavators

Primary cavity excavators (PCE) include bird species that create holes for nesting or roosting in live, dead, or decaying trees. The Primary Cavity Excavator group plays an important ecological role by excavating nest cavities that are later used by other birds and small mammals (including owls, bluebirds, flying squirrels, and others) for denning, roosting, and/or nesting. Thomas (1979) indicates that 62 species use cavities created by cavity excavating birds in the Blue Mountains of Oregon. More than 80 species of birds, mammals, reptiles, and amphibians in the interior Columbia River basin use living trees with decay features, hollow trees, trees with brooms and dead tops, and dead trees (snags) for nesting, roosting, denning, and foraging (Bull et al. 1997, Wisdom et al. 2000). As standing snags decay, they fall to the ground, provide food and shelter for other wildlife species, and contribute to nutrient cycling in forested ecosystems (Johnson and O'Neil 2001). Cavity excavators may also play a role in hastening decomposition of woody material by spreading wood-decay fungi more readily than other media (Farris et al. 2004). Thomas identifies species that excavate cavities in dead wood in his *Wildlife Habitats in Managed Forests of the Blue Mountains of Oregon and Washington* (Thomas 1979, Appendix 20). These species include the Black-backed woodpecker, Downy woodpecker, Hairy

woodpecker, Lewis's woodpecker, Northern flicker, American three-toed woodpecker, Pygmy nuthatch, Red-breasted nuthatch, Red-naped sapsucker, White-breasted nuthatch, White-headed woodpecker, Williamson's sapsucker, Pileated woodpecker, Black-capped chickadee, Mountain chickadee, Chestnut-backed chickadee, and others (Thomas 1979).

The Primary Cavity Excavator group (not individual species of cavity excavating birds) was selected as MIS to be an indicator of dead/down tree (snag) habitat on the Forest. It is assumed that if dead wood (snag) habitat is provided for the Primary Cavity Excavator group, that adequate habitat is also being provided for species that require cavities for some portion of their life cycle. Habitat for these species consists of dead and downed wood features in numerous structural stages and compositions, ranging from post-fire stands, to open juniper and ponderosa pine woodlands, and at the highest elevations subalpine fir and Engelmann spruce forest. Primary cavity excavators typically feed on forest insects, and can regulate populations of these tree-feeding insects.

Declines in densities of large snags (>21" DBH) is a common threat to the cavity nesting group of MIS (Wisdom et al. 2000). Based on past literature describing dead wood dynamics in the Columbia River basin, expert opinion, and modeling, Korol and others (2002) compared existing dead wood data in the basin to historic estimates of dead wood for a number of different structural stages, vegetation types, and fire regimes. Korol and others (2002) found that basin-wide, the abundance of small snags decreased 14 percent when compared to historical conditions; on Forest Service and Bureau of Land Management administered lands, small snag densities actually increased by 7% from historic conditions. Korol and others (2002) also found that the abundance of large snags decreased both basin-wide (-31%) and on Forest Service and Bureau of Land Management administered lands (-8%) when compared to historic conditions, with most losses occurring in the Dry and Moist Forest PVGs due to decreases in late-seral forests. These losses were compounded in managed areas and roaded areas by past harvest and fuelwood cutting.

See Terrestrial Wildlife Specialist's Report for more information on cavity excavators, including threats to the species, conservation status, population trends, Decayed Wood Advisor (DecAID) data and its use in this analysis, and stand (snag) modeling.

### Pileated Woodpecker

The pileated woodpecker was selected as a MIS to be an indicator of dead and downed tree habitat in mature and old growth mixed conifer stands. It is assumed that if good habitat is provided for pileated woodpeckers and their population is maintained at some desired level, that adequate habitat is also being provided for other species that share similar habitat requirements (USDA 1990, page 2-9). The pileated woodpecker plays an important ecological role by excavating nest cavities that are later used by other birds and small mammals (Thomas 1979) and by feeding on forest insect pests. In the Blue Mountains of northeastern Oregon, 22 species of birds and 24 species of mammals utilize vacated woodpecker cavities for reproduction, roosting, shelter, and hibernation (Bull and Meslow 1977). Examples of other wildlife species in the Blue Mountains that utilize nest cavities or roost sites include; bushytail woodrats, flying squirrels, red squirrels, Vaux's swifts, and American marten. Species associated with the same or similar cover types and seral-structural stages include the Williamson's sapsucker, Hammond's flycatcher, chestnut-backed chickadee, brown creeper, winter wren, golden-crowned kinglet, varied thrush, silver-haired bat, and hoary bat (Wisdom et al. 2000).

The Land and Resource Management Plan (USDA 1990) established Designated and Managed

Old Growth stands (Management Areas C1 and C2) to provide habitat for the pileated woodpecker and other old growth associated species. All existing old growth forest habitat on the Umatilla was identified/inventoried and mapped on aerial photos by Ranger District personnel. Specific units were then designated and mapped to meet the minimum size and distributional requirements for MIS (Forest Process Document No. 118, 1990). For pileated woodpecker, the Forest Plan calls for individual habitat units of 300 contiguous acres in size (may be 50-acre minimum sized units no greater than one-quarter mile apart to total 300 acres) in later seral stages (V or VI) as reproduction areas distributed throughout the Forest so that generally each 12,000 to 13,000 acre area of capable habitat contains at least one suitable habitat area. Capable habitat units may be utilized where no suitable habitat is available. An additional 300 acres of feeding habitat in close proximity to habitat units will be provided. In all, 80,275 acres of old growth habitat on the Umatilla National Forest were set aside as management areas C1 and C2, with pileated woodpecker suitable and capable old growth habitat accounting for 58,914 acres of this total. These acres were allocated with the intention to maintain habitat diversity, preserve aesthetic values, and provide old-growth habitat for wildlife. These management areas were designed to serve as the foundation for ensuring MIS population viability at the Forest scale.

The pileated woodpecker is a resident species from southern and eastern British Columbia and southwestern Mackenzie across southern Canada to Quebec and Nova Scotia, south in Pacific states to central California, in the Rocky Mountains to Idaho and western Montana, in the central and eastern U.S. to the eastern Dakotas, Gulf Coast, and southern Florida, and west in the eastern U.S. to Iowa, Kansas, Oklahoma, and Texas (NatureServe 2014). This species is a wide-spread resident in forested areas of Oregon and Washington including the Olympic Peninsula, Coastal Mountains, Klamath Mountains, Cascade Mountains, Blue Mountains, Northeast Washington, and forested fringes of the Puget Trough, Willamette, Rogue and Umpqua Valleys (NatureServe 2014). This species is well distributed across the Umatilla National Forest.

For more information on pileated woodpecker - including threats to the species, conservation status, population trends, decayed wood advisor model, and stand modeling - see the Terrestrial Wildlife Specialist’s Report.

### American Marten

The American marten was selected as a MIS to be an indicator of mature and old growth stands at high elevations. It is assumed that if good habitat is provided for American marten and their population is maintained at some desired level, that adequate habitat is also being provided for other species that share similar habitat requirements (USDA 1990, page 2-9). The Land and Resource Management Plan (USDA 1990) established Designated and Managed Old Growth stands (Management Areas C1 and C2) to provide habitat for the American marten and other old growth associated species. All existing old growth forest habitat on the Umatilla was identified/inventoried and mapped on aerial photos by Ranger District personnel. Specific units were then designated and mapped to meet the minimum size and distributional requirements for MIS (Forest Process Document No. 118; 1990). For marten, the Forest Plan calls for individual habitat units of 160 contiguous acres in later seral stages (V or VI) with a crown closure of at least 50 percent distributed throughout the forest in suitable habitats so that there is at least one habitat area every 4,000 to 5,000 acres of capable habitat. In all, 80,275 acres of old growth habitat on the Umatilla National Forest were set aside as management areas C1 and C2, with American marten suitable and capable old growth habitat accounting for 33,944 acres of this total. These management areas were designed to serve as the foundation for ensuring MIS population viability at the Forest scale.

For more information on American marten, including habitat, conservation status, and other information related to the marten, see the Terrestrial Wildlife Specialist's Report.

### American Three-toed Woodpecker

The American three-toed woodpecker (*Picoides dorsalis*) (formerly known as the northern three-toed woodpecker) was selected as a management indicator species in the Forest Plan to represent dead and down tree habitat in mature and old growth lodgepole pine stands (Table 3-15). It is assumed that if good habitat is provided for three-toed woodpeckers and their population is maintained at some desired level, that adequate habitat is also being provided for other species that share similar habitat requirements (USDA 1990, page 2-9). The three-toed woodpecker plays an important ecological role by excavating nest cavities that are later used by other birds and small mammals (Thomas 1979) and by feeding on forest insect pests following fire and other disturbance such as insect infestations.

The Land and Resource Management Plan (USDA 1990) established Designated and Managed Old Growth stands (Management Areas C1 and C2) to provide habitat for the three-toed woodpeckers and other old growth associated species. For the three-toed woodpecker, the Forest Plan calls for individual habitat units of 75 acres in size in later seral stages (V or VI) distributed throughout the Forest so that generally every 2,000-2,500 acres of capable habitat contains at least one suitable habitat area. In all, 80,275 acres of old growth habitat on the Umatilla National Forest were set aside as management areas C1 and C2, with three-toed woodpecker suitable and capable old growth habitat accounting for 4,967 acres of this total. These management areas were designed to serve as the foundation for ensuring MIS population viability at the Forest scale.

For more information on American three-toed woodpecker, including habitat, conservation status, and other information related to the species, see the Terrestrial Wildlife Specialist's Report.

## Threatened, Endangered, Proposed, Candidate, and Sensitive Species

The Endangered Species Act requires federal agencies to use their authorities to carry out programs to conserve endangered and threatened species (ESA Section 5), and to ensure that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of listed or proposed species, or result in the destruction or adverse modification of their critical habitats (ESA Section 7). The Forest Service has established direction in Forest Service Manual 2670 to guide the management of habitat for threatened, endangered, and sensitive species. Habitats and activities for threatened and endangered species on National Forest System lands are to be managed to achieve recovery objectives such that special protections under the ESA are no longer necessary (FSM 2670.21). Forest Service Manual 2670.31 defines Forest Service policy for threatened and endangered species as follows:

- Place top priority on conservation and recovery of endangered, threatened, and proposed species and their habitats through relevant National Forest System, state and private forestry, and research activities and programs.
- Establish through the Forest planning process objectives for habitat management and/or recovery of populations, in cooperation with states, the US Fish and Wildlife Service and other federal agencies.
- Review, through the Biological Evaluation process, actions and programs authorized, funded, or carried out by the FS to determine their potential for

effect on threatened and endangered species and species proposed for listing.

- Avoid all adverse impacts on threatened and endangered species and their habitat except when it is possible to compensate for adverse impacts through reasonable and prudent measures identified in a biological opinion rendered by the US Fish and Wildlife Service.
- Initiate consultation or conference with the US Fish and Wildlife Service when the Forest Service determines that proposed activities may have an effect on threatened or endangered species, are likely to jeopardize the continued existence of a proposed species, or result in the destruction or adverse modification of critical or proposed critical habitat.
- Identify and prescribe measures to prevent adverse modification or destruction of critical habitat and other habitats essential for the conservation of endangered, threatened, and proposed species.
- Protect individual organisms or populations from harm or harassment as appropriate.

A species list was requested from the US Fish and Wildlife Service for Grant and Wheeler Counties (USDI 2014a) in order to identify which endangered, threatened, de-listed, candidate, and proposed species, if any, may be present in the project area. This species list indicated that there is a potential for the gray wolf (Endangered) to occur in Wheeler and Grant counties. This list also indicated that there is a potential for the greater sage grouse (Candidate) to occur in Wheeler and Grant Counties. There is no critical habitat for these species in either county. Because the sage grouse is not known or suspected to occur on the Umatilla National Forest, it will not be analyzed further in this document. Review and consideration of the species list provided by the US Fish and Wildlife Service for the Kahler Dry Forest Restoration Project satisfies direction provided in FSM 2671.44 for coordination (consultation) with other federal agencies.

Sensitive species are those identified by the Pacific Northwest (Region 6) Regional Forester as needing special management to meet Forest Service Manual direction, Department regulations, and National Forest Management Act obligations and requirements (USDA 2011). Sensitive Species are those for which population viability is a concern, as evidenced by: 1. Current or predicted downward trends in population numbers or density; or, 2. Current or predicted downward trends in habitat capability that would reduce a species' existing distribution (FSM 2670.5). The Forest Service is required to manage National Forest System lands to maintain viable populations of all native and desired nonnative wildlife, fish, and plant species (including Sensitive Species) in habitats distributed throughout their geographic range on National Forest System lands (FSM 2670.22). Forest Service activities are required to be conducted to avoid actions that may cause a species to become threatened or endangered as a result of Forest Service actions (FSM 2670.12, 2670.22).

Sensitive Species addressed on the Umatilla National Forest include those that have been documented (valid, recorded observation) or are suspected (likely to occur based on available habitat to support breeding pairs/groups) to occur within or adjacent to the Umatilla National Forest boundary. General Forest Service direction for sensitive species is summarized below (FSM 2670.32):

- Assist states in achieving their goals for conservation of endemic species.
- As part of the NEPA process, review programs and activities using a biological evaluation, to determine their potential effect on sensitive species.

- Avoid or minimize impacts to species whose viability has been identified as a concern. If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.
- Establish management objectives in cooperation with states when projects on National Forest System lands may have a significant effect on sensitive species population numbers or distributions.

Federally listed and sensitive species with a potential to occur on the Umatilla National Forest are found in Table W-28. This determination is based on observation records, vegetative and wildlife species inventory and monitoring, published literature on the distribution and habitat utilization of wildlife species, information provided by the US Fish and Wildlife Service, and the experience and professional judgment of wildlife biologists on the Umatilla National Forest.

**Table 3-22 Federally ESA listed and Region 6 Sensitive Species with a potential to occur on the Umatilla National Forest.**

| Species | | | Occurrence[1] | | |
|---|---|---|---|---|---|
| **Common Name** | **Scientific Name** | **Status[2]** | **Umatilla National Forest** | **Kahler Analysis Area** | **Fully Analyzed in this BE** |
| American peregrine falcon | *Falco peregrinus anatum* | SEN | S | N | |
| North American wolverine | *Gulo gulo* | PTHR | S | H | |
| Canada lynx | *Lynx canadensis* | THR | D | N | |
| Columbia spotted frog | *Rana luteiventris* | SEN | D | K | X |
| Gray wolf[3] | *Canis lupus* | END | D | H | X |
| Rocky Mountain tailed frog | *Ascaphus montanus* | SEN | D | N | |
| Lewis' woodpecker | *Melanerpes lewis* | SEN | D | K | X |
| Bald eagle | *Haliaeetus leucocephalus* | SEN | D | H | X |
| Painted turtle | *Chrysemys picta* | SEN | S | N | |
| Townsend's big-eared bat | *Corynorhinus townsendii* | SEN | D | N | |
| Upland sandpiper | *Bartramia longicauda* | SEN | S | N | |
| White-headed woodpecker | *Picoides albolarvatus* | SEN | D | H | X |
| Fir pinwheel | *Radiodiscus abietum* | SEN | D | N | |
| Johnson's hairstreak | *Callophrys johnsoni* | SEN | D | H | X |
| Intermountain sulphur | *Colias christina pseudochristina* | SEN | S | H | X |
| Yuma skipper | *Ochlodes yuma* | SEN | S | N | |

**[1] S = Suspected, likely to occur based on habitat availability to support breeding pairs/groups within Forest boundary; D = Documented, reliable, recorded observation within the Forest boundary; K = Species known to occur within or near project area; H = Habitat present in project area; N = Habitat not present in project area.**

**[2] SEN = Sensitive species in USDA Forest Service Region 6; THR = ESA listed as Threatened; END = ESA listed as Endangered; PTHR = Proposed Threatened under the ESA; CAN = Candidate for listing under the ESA.**

**[3] The Northern Rocky Mountain (NRM) Distinct Population Segment of the gray wolf was delisted (removed as endangered from the Endangered Species List), effective May 4, 2009 (USDI 2009b). On August 5, 2010, the Final Order to remove the NRM gray wolf from the Endangered Species List was overturned by a US District Court ruling. Effective May 5, 2011, the US Fish and Wildlife Service reinstated the terms of the 2009 final rule that removed the gray wolf from the Federal Endangered Species List in a portion of the Northern Rocky Mountain Distinct Population Segment. Currently, the gray wolf is considered a Region 6 Sensitive Species on that portion of the Umatilla National Forest east of State Highway 395 and federally listed as Endangered west of State Highway 395. The gray wolf is designated as Endangered in the Kahler Project Area. No Critical Habitat has been proposed or designated in the Northern Rocky Mountains or any portion of Oregon (USDI 1978, USDI 2009a).**

## Species Eliminated from Further Effects Analysis

### *Canada Lynx*

Lynx are medium-sized cats that are strongly associated with boreal forest habitats. Lynx habitat can generally be described as moist boreal forests (generally between 4,100-6,600 feet in elevation) that have cold, snowy winters and a snowshoe hare prey base (Ruggiero et al. 2000, NatureServe 2014). The predominant vegetation of boreal forest is conifer trees, primarily species of spruce (*Picea* spp.) and fir (*Abies* spp.). In mountainous areas, the boreal forests that lynx use are characterized by scattered moist forest types with high hare densities in a matrix of other habitats (e.g., hardwoods, dry forest, non-forest) with low hare densities. These matrix habitats are used for traveling between patches of boreal forest where the majority of foraging occurs. Snowshoe hares comprise the majority of the lynx diet. Lynx prey opportunistically on other small mammals and birds (including red squirrels, other small rodents, grouse, etc.), particularly when snowshoe hare populations are low, as is the case in southern latitudes.

The Canada lynx was listed under the endangered species act as Threatened on March 24, 2000 (65 FR 16052, USDI 2000). The Forest Service and the US Fish and Wildlife Service signed a Canada Lynx Conservation Agreement in 2000. This conservation agreement committed the Forest Service to using the Lynx Conservation Assessment and Strategy (LCAS, Ruediger et al. 2000) in determining effects of actions on the lynx until Forest Plans could be revised to adequately conserve the lynx. The agreement was revised in 2005, and provided for the consideration of the LCAS only in habitats that are currently occupied by lynx. The agreement was further revised on May 12, 2006 (USDI 2006a) to define "occupied habitat" and identify National Forests currently occupied by lynx. This amendment and the Regional Forester's Letter dated June 20, 2006 (USDA 2006) identified the Umatilla National Forest as unoccupied habitat. As unoccupied habitat, the Canada Lynx Conservation Agreement does not apply to the Umatilla National Forest. There is no requirement to manage for lynx in unoccupied habitat. The unoccupied determination was based on a lack of verified lynx observations (National Lynx Survey results, Forest and District databases, etc.) and a lack of evidence of lynx reproduction. While mapped suitable lynx habitat (unoccupied) is present on the Forest, there is no suitable habitat within the Kahler analysis area. There have been no confirmed observations of this species on the District, and the lynx is not currently known to occur on the Forest. Because the Canada lynx was not on the species list provided by the US Fish and Wildlife Service identifying listed species with a potential to occur in Grant and Wheeler Counties, the Umatilla National Forest is classified as unoccupied lynx habitat (Regional Forester's Letter dated June 20, 2006 (USDA 2006) and Conservation Agreement Amendment dated May 12, 2006 (USDI 2006a)), and there is no suitable habitat in the analysis area, there will be no further analysis of potential impacts on this species.

### *Painted Turtle*

Preferred habitat for the painted turtle includes lakes, ponds, marshes, or low gradient, slow moving streams with a muddy or sandy substrate and aquatic vegetation (NatureServe 2014, St John 2002, Csuti et al. 1997). This species nests in soft soil in openings up to 500 feet from water (NatureServe 2014, St. John 2002, and Csuti et al. 1997). Historically, the District contained few lakes and ponds. Rangeland developments have created ponds for stock-watering purposes in the analysis area. These ponds would not be considered suitable habitat for this species due to the quality of these habitat features; they are generally rock bottom-ponds with little vegetation. In addition, painted turtles have not been observed on the Heppner Ranger District or on the Umatilla National Forest. No further analysis of environmental effects will occur for the painted turtle because suitable habitat does not occur on the Heppner Ranger District and this species has not been observed in or believed to be present in the analysis area.

### *Peregrine Falcon*

Suitable habitat for the peregrine falcon includes various open habitats from open grasslands to forested stands in association with suitable nesting cliffs (NatureServe 2014, Marshall et al. 2003). The falcon often nests on ledges or holes on the face of rocky cliffs or crags. Ideal locations include undisturbed areas near water with a wide view and close to plentiful prey. Foraging habitats of woodlands, open grasslands, and bodies of water are generally associated with the nesting territory. Falcons are known to forage over large areas, often ten to fifteen miles from the eyrie. Suitable cliff nesting habitat is not present in the Kahler analysis area. Aerial surveys of potential nest sites were completed on the District in the 1990s. No peregrine falcon eyries were observed. No further analysis of environmental effects on the peregrine falcon will occur due to the fact that the proposed activities would not occur in the vicinity of suitable nesting cliffs and the species is not known to be resident on the District.

### *Townsend's Big-eared Bat*

The Townsend's big-eared bat is widely distributed throughout the western half of the United States. This species primarily uses caves and abandoned mines for day roosting and hibernating (Verts and Carraway 1998). It has also been noted as using buildings for roosting. Research indicates that this species is sensitive to disturbance at roost sites and may abandon roost sites if disturbed. The Townsend's big-eared bat is known to occur in the vicinity of the Keeney Mine on the North Fork John Day Ranger District. There have been no formal surveys for this species on the District. Roost habitat is limited in the Kahler analysis area; there are no abandoned mines (with shafts) and no abandoned buildings that would potentially provide roosting habitat for this species. Because there are no known roost sites and this species is not known or believed to occur in the Kahler analysis area, there will be no further analysis of environmental effects for this species.

### *Upland Sandpiper*

Upland sandpiper habitat is primarily restricted to open tracts of grassland habitat with water or intermittent creeks nearby. This includes large montane meadows and prairie-grasslands (1,000-30,000 acres), usually surrounded with trees (lodgepole pine and some ponderosa pine), or in the middle of sagebrush communities, and generally at elevations from 3,400 to 5,000 feet (Csuti et al. 1997, NatureServe 2014, and Marshall et al. 2003). Taller grassy areas are preferred for nesting and brood cover (NatureServe 2014). Foraging occurs in open meadows (Csuti et al. 1997, NatureServe 2014, and Marshall et al. 2003). Observations of the species have occurred near the town of Ukiah. Large tracts of montane meadows and prairie grasslands are not present in the Kahler analysis area. Because this species is not known to occur in the vicinity of the project area or District and there is no suitable habitat within the analysis area, there will be no further analysis of environmental effects for the upland sandpiper.

### *Yuma Skipper (butterfly)*

The Yuma skipper is found around reed beds in and around freshwater marshes, streams, oases, ponds, seeps, sloughs, springs, and canals (Pyle 2002). Adults are almost always found in close association with the primary larval host plant *Phragmites australis* (giant or common reed). At the National level, this species is ranked N5 (Secure); in Oregon, it is ranked S1? (critically imperiled) (NatureServe 2014). At the species level the Yuma skipper is common in its limited habitat (areas with its host plant) in California, Nevada, Utah, Colorado, northern New Mexico, Arizona, and in isolated areas in Oregon (3 known locations) and Washington. Although all known Oregon locations are situated well off the Forest, and the host plant largely absent from National Forest System lands, this species is suspected to occur on the Umatilla National Forest. Site specific threats are unknown but general threats include loss of wetland habitats to urban or

agricultural uses, pesticide spraying in and near wetlands, and grazing damage to wetland habitat. There have been no surveys for this species on the District. Because this species is not known to occur on the District, its primary host plant is not present, and the proposed activities do not constitute an identified threat to the species and its habitat, there will be no further analysis of environmental effects for the Yuma skipper.

### *Fir Pinwheel (Terrestrial Snail)*

This species is found in moist and rocky Douglas-fir forest at mid-elevations in valleys and ravines (NatureServe 2014). This species is often found in or near rock talus or under downed logs. It feeds on detritus and microorganisms on vegetation surfaces. It has been observed at locations in Montana, Idaho, Washington, and Oregon. This species is known from one location on the Umatilla National Forest (Walla Walla Ranger District); the current status of this population is not known. Threats to this species include alteration of appropriate habitat through logging and grazing. Wildfire, road construction, land development, chemical weed control, and drying of sites are also thought to be threats to this species. This species is ranked as Apparently Secure (G4 and N4) at the Global and National scales (NatureServe 2014). At the state level, this species is ranked S1 (critically imperiled) in Oregon (NatureServe 2014). There have been no surveys for this species on the District. Appropriate habitat is not present in the Kahler analysis area. For these reasons, there will be no further analysis of environmental effects for the fir pinwheel.

### *Rocky Mountain Tailed Frog*

The tailed frog differs from other frogs found on or adjacent to the Umatilla National Forest by selecting cold, high gradient, boulder and cobble dominated streams for breeding. Streams with dense overstory shade are preferred. Froglets and adults are closely associated with the streams, often hiding in gravel and cobble substrates. Tadpoles cling to boulders and cobbles; full development of this species requires as many as 8 years to complete (NatureServe 2014). NatureServe ranks this species as apparently secure (G4) globally, and imperiled (S2) at the scale of the state of Oregon (NatureServe 2014).

The distribution of this species in Oregon is relatively restricted to the northeast corner of the state. Observations have been recorded in Wallowa, Union, Baker, and Umatilla Counties. There are no observation records for this species in the analysis area. There are no perennial streams in the Kahler analysis area that would be used by this species for breeding, foraging, and rearing habitat based on geomorphology, gradient, and stream temperature. This species is not known to or suspected to occur in the analysis area. For this reason, there will be no further analysis of effects for the Rocky Mountain tailed frog.

### *North American Wolverine*

The wolverine inhabits high elevation, alpine and subalpine conifer forest types, with limited exposure to human interference (Ruggiero et al. 1994, Wolverine Foundation (TWF) 2012). Natal denning habitat includes open rocky slopes (talus or boulders) surrounded or adjacent to high elevation forested habitat and forested and semi-forested subalpine and alpine vegetation. Snow cover appears to be critical to denning habitat selection; wolverine select areas that maintain a snow depth greater than 3 feet into April and May for denning (Aubrey et al. 2007, Parks 2009, Ruggiero et al. 1994, TWF 2012). Research has found that wolverine spend a large proportion of their time, regardless of the season, in areas that provide suitable natal denning habitat (Parks 2009). This species has a National Heritage Rank of critically imperiled (S1) in Oregon and vulnerable to extirpation or extinction (N3) at the National level (NatureServe 2014). Wolverine populations appear to be small, low density, and relatively isolated even in

ideal habitat (Aubry et al. 2007, NatureServe 2014). The wolverine is an opportunistic scavenger, with large mammal carrion the primary food source year-round. While foraging, they generally avoid large open areas and tend to stay within forested habitat at mid and high elevations (>4,000') and typically travel 18-24 miles to forage (Ruggiero et al. 1994, TWF 2012).

This species is currently a Region 6 Sensitive Species. A Proposed Rule to list the Distinct Population Segment of the North American wolverine in the contiguous United States as Threatened under the Endangered Species Act was released on February 4, 2013 (USDI 2013b). The US Fish and Wildlife Service does not list the North American wolverine as a species potentially occurring in Umatilla County (USDI 2013a). Snow tracking surveys conducted on the District during the early 1990s and 2011 for wolverine, fisher, American marten, and lynx have resulted in no suspected wolverine tracks. Confirmed observations of wolverine have occurred in the last several decades in lower elevation areas of Oregon. These records are believed to be extreme dispersal events from core populations, and are not representative of self-sustaining populations (Aubry et al. 2007, Verts and Carraway 1998).
No potential natal denning habitat is present in or near the analysis area. Contiguous subalpine forest types, backcountry (wilderness, Inventoried Roadless, Scenic Areas, and potential wilderness) habitat, open rocky slopes at high elevations, and sufficient snow cover for natal denning do not occur in the Kahler project area. Potential foraging habitat is present in the analysis area. These stands are relatively small and disconnected from one another due to past activities and the broken nature (timbered draws and open ridges) of the analysis area. For these reasons, habitat quality is considered poor. The wolverine is not currently known to occur in the Kahler analysis area; there have been no sightings of this species in the area. Based on the quality and quantity of potential poor quality foraging habitat, the transportation system in the Kahler area, and the distance from suitable subalpine and backcountry habitats, it is very unlikely that wolverine would pass through the Kahler area. Because the wolverine was not on the preliminary species list provided by the USDA Fish and Wildlife Service identifying ESA listed, candidate, and proposed species, is not known to occur in the area, there is no potential natal denning habitat, no low disturbance backcountry habitat, and limited low quality foraging habitat is present in the analysis area, there will be no further analysis of effects for the North American wolverine.

## Species Analyzed In Detail

### *Bald Eagle - Sensitive*

Preferred habitat for the bald eagle occurs near large bodies of water (rivers, lakes, etc.) that support an adequate food supply (NatureServe 2014 and USDI 1986). In the Pacific Northwest recovery area, preferred nesting habitat for bald eagles is predominately uneven-aged, mature, coniferous stands (ponderosa pine and Douglas-fir) or large black-cottonwood trees along riparian corridors (NatureServe 2014 and USDI 1986). Eagles usually nest in mature conifers with gnarled limbs that provide ideal platforms for nests. The nest tree is characteristically one of the largest in the stand and usually provides an unobstructed view of a body of water (USDI 1986). In Oregon, the majority of nests are within 0.5 miles of the shoreline (Anthony and Isaacs 1981). Important prey species include fish, birds, mammals, and carrion. (NatureServe 2014 and USDI 1986). This species was removed from the Federal List of Endangered and Threatened Wildlife by the US Fish and Wildlife Service on August 8, 2007 (USDI 2007a). The northern bald eagle population is currently secure (NatureServe 2014).

Bald eagle nesting habitat is not present in the Kahler analysis area. The streams within the allotment do not have adequate fish populations to support a nesting pair of eagles and their

young through the summer. The nearest bald eagle nest is located approximately .75 miles east of the Kahler project area. A Management Plan was prepared for this nest (Dry Creek) in 1999 (VanWinkle 1999). This plan was designed to meet or exceed the guidelines for bald eagle management in the Recovery Plan for the Pacific Bald Eagle (USDI 1986). It also meets the requirements of the Bald and Golden Eagle Protection Act, Migratory Bird Treaty Act, and Endangered Species Act. The Plan identifies a Bald Eagle Consideration Area (BECA) for the nest.

The BECA encompasses the home range of a nesting pair of eagles, including the nest site, feeding areas, and perching/roosting areas. The designation of an area within the BECA does not automatically restrict human activity within the BECA boundary; management recommendations are provided to assess and mitigate for potential impacts to eagles. At a smaller scale, the Bald Eagle Management Area (BEMA) includes the nest tree, roost tree(s), and other perches. All activities in the BEMA are subordinate to the needs of the eagle. A portion of the Kahler analysis area lies within the Bald Eagle Management Area and Bald Eagle Consideration Area for this nest.

Management recommendations (Van Winkle 1999) applicable to the Kahler Project include:

1. Evaluate all present and future projects proposed on public lands within the BECA for potential impacts to the nesting pair;
2. Enforce seasonal restrictions within the BECA to avoid disturbance to nesting or roosting eagles;
3. Maintain or improve fish and wildlife habitat to enhance foraging opportunities for eagles.

The Recovery Plan for the Pacific Bald Eagle (USDI 1986) and the National Bald Eagle Management Guidelines (USDI 2007b) also identify tasks that would contribute to the recovery of the bald eagle.

### *Columbia Spotted Frog – Sensitive*

Columbia spotted frogs are highly aquatic and rarely found far from permanent water, but they can also utilize intermittent streams and meadows in the spring. They occupy the sunny, vegetated margins of streams, lakes, ponds, spring complexes, and marshes. Columbia spotted frogs are mobile; they seasonally move between hibernacula (overwintering sites), breeding habitat, and wet meadow/riparian foraging areas (Bull and Hayes 2002). Some Columbia spotted frogs will remain and overwinter in breeding habitat if conditions are ideal. Hibernacula are typically ponds, slow-moving streams, and springs where water surrounding the frog does not freeze and oxygen levels are adequate (Tait 2007, Bull and Hayes 2002). Breeding occurs in shallow (<60 cm) emergent wetlands such as riverine side channels, beaver ponds, springheads, and the wetland fringes of ponds, small lakes, and livestock ponds. Water levels must persist until eggs are hatched and tadpoles transform. Adults exhibit strong fidelity to breeding sites, with egg deposition typically occurring in the same areas in successive years. Foraging takes place in all types of permanent or ephemeral wetland habitats, including meadows, stream margins, ponds, ditches, and intermittent habitats; these areas constitute movement corridors between breeding and hibernation sites. Because frogs are especially vulnerable to predation during summer foraging, some level of overhead plant cover is optimal. NatureServe ranks the Columbia spotted frog as apparently secure (N4) at the National and Global scale and imperiled/vulnerable (S2/S3) at the state (Oregon) level (NatureServe 2014). The Great Basin subpopulation is ranked as imperiled (T2) due to a high risk of extinction due to very restricted range, very few populations, steep population declines, and other factors. Columbia spotted

frogs in northeast Oregon are more closely-affiliated with the Northern Distinct Population Segment (DPS) of the species than they are with the Great Basin DPS (Tait 2007).

This species has been observed in the vicinity of the analysis area. Surveys in 2006 identified breeding locations in the vicinity of Bull Prairie Reservoir and upper Porter Creek. It is assumed to be present in the analysis area due to the fact that suitable ponds (potential breeding and overwintering habitat) are present. Summer foraging habitat is also assumed present in some locations associated with perennial streams.

### *White-Headed Woodpecker - Sensitive*

The white-headed woodpecker utilizes mature, single-stratum ponderosa pine-dominated habitats for nesting and foraging (NatureServe 2014). This species has also been found to utilize post-fire stands (mixed severity and mosaic burns) for foraging and nesting (Wightman et al. 2010). This species relies almost exclusively upon the seeds from large ponderosa pine cones for its foraging needs. This species will also utilize insects that are gleaned from ponderosa pine trees. Large ponderosa pine snags are utilized for nesting purposes. Because the white-headed woodpecker has a limited need and use of snags as foraging areas, the species snag requirements are less than those required by other primary cavity excavators such as the pileated, downy, and hairy woodpeckers. Interior Columbia Basin Ecosystem Management Project (Wisdom et al. 2000) indicates that basin-wide, >50% of watersheds have strong negative declines in the availability of source habitats (old growth ponderosa pine, aspen/cottonwood/willow, large diameter ponderosa pine snags) for this species. The White-headed Woodpecker Conservation Strategy (Mellen-McLean et al. 2013) recommends that the following management activities or actions be taken to restore White-headed woodpecker habitat:

- Retain, protect, and grow more large, older ponderosa pine trees used for foraging;
- Retain, protect, and grow large snags used for nesting;
- Reduce shrub cover and excess down wood to reduce numbers of small mammal which prey on nests;
- Reduce canopy density across the landscape to provide interspersion of open and closed pine/dry forest stands;
- Retain and create spatial heterogeneity within stands;
- Reintroduction of rust-resistant white pine or sugar pine where appropriate would provide an alternative winter food source (not applicable to the Kahler planning area).

The white-headed woodpecker is known to occur in the analysis area. A pair of white-headed woodpeckers was observed in proposed Unit 10 during reconnaissance in the summer of 2013 in a dense mixed conifer stand. While there have been anecdotal sightings of white-headed woodpecker in the vicinity of the Wheeler Point Fire Area (high severity burned stands and burned stands with relatively intact overstories along the 25 Road), none have been documented in the database of record. Due to fire suppression in dry upland forest habitats, many areas that historically supported open stands of large diameter ponderosa pine now support mixed ponderosa pine, Douglas-fir, grand fir, and larch stands. The Silviculture Report indicates that there are currently 1,550 acres of old forest single-stratum habitat in the analysis area. This

structural type is generally believed to be synonymous with suitable white-headed woodpecker habitat.

### *Lewis' Woodpecker - Sensitive*

The Lewis' woodpecker is typically associated with open ponderosa pine woodland habitat near water. They have also been associated with stand replacement fires (5 to 10 years post-fire). Lower elevation ponderosa pine stands are generally considered suitable habitat for this species. This species will also utilize post-fire habitats that have a high proportion of ponderosa pine and Douglas-fir. The Lewis' woodpecker is an aerial insectivore that uses dominant snags in burned and unburned areas for perching. This species utilizes large diameter dead and dying trees (generally cottonwood and ponderosa pine), typically near streams, for nesting. This species typically nests in pre-existing cavities, but will also excavate cavities. Although this species typically nests in ponderosa pine snags, it has been found to nest in other species, including white fir and lodgepole pine (Raphael and White 1984).

The Interior Columbia Basin Ecosystem Management Project (Wisdom et al. 2000) indicates 85% of the watersheds throughout the basin show a strong negative trend in source habitats (old forest single-stratum structural stages of ponderosa pine and multi-strata stages of Douglas-fir and western larch, and riparian cottonwood woodlands). In the Blue Mountains, 72% of watersheds have experienced >60% reduction in source habitats when compared to historical conditions.

The Lewis' woodpecker is known to occur in the analysis area. Observations (individuals and reproduction) have been recorded in the western portion of the analysis area associated with the Wheeler Point Fire. It is likely that this species occurs elsewhere in the analysis area based on the presence of suitable dry upland forest stands.

### *Gray Wolf - Endangered*

Gray wolves (*Canis lupus*) are the largest wild members of the dog family (Canidae). The wolf is a habitat generalist inhabiting a variety of plant communities, typically containing a mix of forested and open areas with a variety of topographic features (Verts and Carraway 1998). Suitable habitats are those that have a high proportion of forested cover and public lands, high elk densities, low road densities, and low livestock densities (NatureServe 2014, Oakleaf et al. *in* USDI 2009c). The gray wolf prefers areas with few roads, generally avoiding areas with an open road density greater than one mile per square mile (NatureServe 2014). Research indicates that inventoried roadless areas (other undesignated roadless areas were not considered in this science) contribute to biodiversity and habitat connectivity and provide important habitats for the conservation of threatened and endangered wildlife (Crist et al. 2005, Loucks et al. 2003, DeVelice and Martin 2001) when combined with other protected areas (wilderness and National Park lands). Packs typically occupy large distinct territories from 200 to 500 square miles and defend these areas from other wolves or packs.

In 1974, two subspecies of gray wolf were listed under the Endangered Species Act as endangered (39 FR 1171, January 4, 1974). In 1978, the gray wolf was relisted at the species level throughout the majority of the conterminous 48 States (43 FR 9607, USDI 1978). On November 22, 1994, portions of Idaho, Montana, and Wyoming were designated as nonessential experimental population areas for the gray wolf (59 FR 60252 and 60266, November 22, 1994). The Northern Rocky Mountain Wolf Recovery Plan was completed in 1980 and revised in 1987. The revised recovery plan established population recovery goals for the Northern Rocky Mountain gray wolf in 3 distinct recovery areas: northwestern Montana, Central Idaho, and the

Yellowstone National Park area. The NRM wolf population achieved its numerical, distributional, and temporal portions of the recovery goal in 2002 (74 FR 15124, USDI 2009b). Subsequently, the US Fish and Wildlife Service identified the Northern Rocky Mountain Distinct Population segment (DPS) and delisted the Northern Rocky Mountain DPS (as described, except for Wyoming) in 2009 (74 FR 15123, USDI 2009b). The rule delisting the NRM gray wolf was overturned on August 5, 2010 through a U.S. District Court ruling. Effective May 5, 2011, the US Fish and Wildlife Service reinstated the terms of the 2009 final rule that removed the gray wolf from the Federal Endangered Species List in a portion of the Northern Rocky Mountain Distinct Population Segment, as directed by the FY 2011 Appropriations Bill. Currently, the gray wolf is considered a Region 6 Sensitive Species on that portion of the Umatilla National Forest east of State Highway 395 and federally listed as Endangered west of State Highway 395. The wolf is classified as Endangered in the Kahler analysis area. No critical habitat has been proposed or designated in the Northern Rocky Mountains (USDI 2009a).

There are currently eight wolf packs known to occur in northeast Oregon; none are located on the Heppner Ranger District. The US Fish and Wildlife Service concludes that dispersal of lone individuals from currently occupied areas in Montana, Idaho, and Wyoming is expected to continue, but pack development and persistence outside the NRM DPS is unlikely due to low survival of dispersers and suitable habitat is limited and distant from core NRM gray wolf populations (74 FR 15128, USDI 2009b). The US Fish and Wildlife Service also concludes that packs that may become established in the eastern half of Oregon would have an inherently small role in the overall conservation of the NRM DPS due to the small amount of habitat available in the Oregon portion of the DPS and the limited number of packs that this habitat would support (74 FR 15173, USDI 2009b).

The gray wolf was on the species lists provided by the US Fish and Wildlife Service identifying listed species with a potential to occur in Wheeler and Grant Counties (USDI 2014a). Unconfirmed sightings of gray wolves have occurred on the District in the past several years. These sightings have been investigated by the US Fish and Wildlife Service, Oregon Department of Fish and Wildlife, and the Forest Service. Wolves are not currently known to be resident on the south half of the Umatilla National Forest, including the Kahler planning area. No denning or rendezvous sites are known to occur on the District. Potential habitat in the analysis area would be considered marginal due to open road densities and associated disturbance. It is expected that dispersal from core areas to the east and from established packs in northeast Oregon will continue in the future.

### *Intermountain Sulphur (Butterfly)*

The intermountain sulphur butterfly inhabits open woodland from 3,400 to 5,000 feet in elevation, including meadows, roadsides, and open forest. Warren (2005) states that members of this subspecies are most often found on steep sunny slopes at the ecotone between forest and shrub-steppe or grassland habitats. Habitat for this species includes sagebrush with scattered ponderosa pine, including both south and east facing slopes. The larvae of this subspecies feed on *Lathyrus* (sweat pea) species. This species has an unknown status at the National Level, and has not been evaluated for the state of Oregon (NatureServe 2014). This species is found from the eastern Blue Mountains in Washington, through the Blue and Ochoco Mountains in Oregon, along the Snake River in Idaho, and south into western Utah. Although all known Oregon locations are situated east of the Forest, this species is suspected to occur on the Umatilla National Forest. Loss of habitat due to agricultural conversion and development are the primary threats to this species. Pesticide use, especially aerial applications, also poses serious threats to this species.

There have been no surveys for this species on the District. There have also been no known incidental observations of this species on the District. Potential habitat for this species is present in the analysis area. Based on the fact that potential habitat is present, this species is assumed present in the analysis area.

### *Johnson's Hairstreak (Butterfly)*

Larvae of this butterfly are associated with coniferous forests that contain mistletoes of the genus *Arceuthobium* (dwarf mistletoes). Adults feed on a variety of nectar flowers. This species is considered to be an obligate old growth butterfly; due to their association with and tendency to reside in the forest canopy, this species is not often encountered. This species will also use late successional second growth forests. The Johnson's hairstreak is globally ranked as G3G4 (Vulnerable/Apparently Secure) (NatureServe 2014). Its status is uncertain; it is vulnerable and at moderate risk of extinction due to a restricted range, relatively few populations, recent or widespread declines, or other factors, or it is uncommon but not rare. Due to declines or other factors there is some cause for long-term concern. In Oregon this species of butterfly is ranked S2 (imperiled) (NatureServe 2014). Scattered sightings of this species have occurred in the Blue Mountains, Wallowa Mountains, Siskiyou Mountains, the Coast Range, and the Cascade Mountains. The current range of the butterfly is not well understood, as most observations tend to be old. This species has been observed on the Umatilla National Forest (Walla Walla Ranger District). Threats to this species include habitat destruction (timber harvest, sanitation harvest, fire, etc.) and application of pesticides (including BTK bacterium) and herbicides.

Surveys for this species were initiated in the summer 2012 on the Heppner and North Fork John Day Ranger Districts. Host plant material was collected from 11 sites in suitable habitat areas on the Heppner District. Eight of the sites were located in the Kahler analysis area. Genetic analysis of possible Johnson's hairstreak larvae found that they were the closely-related thicket hairstreak butterfly. Old forest stands and dense second growth stands containing dwarf mistletoe are present in the analysis area. Occasional heavy infestations of mistletoe are present in the analysis area. While this species was not found during surveys, it is possible that it is present on the District and in the Kahler analysis area.

## Other Species

These are species that are "of interest" to the public at the local or regional level, or were identified as a species of concern by the US Fish and Wildlife Service. Occurrence determinations are based on observation records, vegetative and wildlife species inventory and monitoring, published literature on the distribution and habitat utilization of wildlife species, and the experience and professional judgment of wildlife biologists on the Umatilla National Forest.

### *Northern Goshawk*

Research indicates that in Oregon, goshawk select for older coniferous stands with larger diameter trees than other accipiter species (NatureServe 2014, Moore and Henny 1983). Greenwald and others (2005) reviewed existing research on goshawk habitat selection and concluded that goshawk select (use at a greater proportion than its availability) late successional forest (and associated large diameter trees, multiple canopy layers, abundant woody debris, and high canopy closure (mean = 40% canopy closure)) within their home ranges. Dense late and old structure forest habitat is clearly important in close proximity to nest locations, but has been found to decrease in relative abundance with increasing distance from the nest (Daw and DeStefano 2001); successful nesting also occurs in mid aged dense canopy stands and occasionally in open-canopied stands in northeast Oregon (Daw and DeStefano 2001). While

goshawk show a strong selection for mature stands for nesting, they will utilize a broad range of stem densities, age classes, and canopy closures (Beier and Drennan 1997, Daw and DeStefano 2001, Greenwald et al. 2005), they tend to avoid openings (including new clear-cuts) and young, early seral stands (generally <30 years old)(Greenwald et al. 2005). Existing research indicates that a mix of age classes and forest seral stages (including dense canopy forest and more open, younger stands) provide hunting cover, protection from predators, and habitat for abundant prey, including those characteristic of both dense and more open habitat types (Reynolds et al. 1992, Daw and DeStefano 2001, Wiens et al. 2006). Nesting sites typically consist of a dense cluster of large trees and is generally situated in close proximity to a stream or other water source (Daw and DeStefano 2001). Potential foraging and nesting habitat is present in the analysis area. Table W-29 shows the existing condition of goshawk habitat in the analysis area.

**Table 3-23 Suitable northern goshawk habitat in the Kahler analysis area.**

| **Northern Goshawk Habitat Type** | **Existing Habitat (acres)** |
|---|---|
| Reproductive | 1,797 |
| Forage | 21,344 |
| TOTAL HABITAT | 23,141 |

There are 1,797 acres of suitable nesting habitat and 21,344 acres of suitable foraging habitat in the analysis area (queried from GIS database). The mean size of potential nesting habitat stands is 24 acres; the largest individual stand is 90 acres in size. Nesting habitat tends to be closely associated with riparian habitats and dense dry and moist upland forest stands. Nesting habitat is scattered in patches across the entire project area. Potential foraging habitat is located throughout the analysis area

No active or historic northern goshawk nests are known to exist in the analysis area. No active or historic goshawk nests were encountered during reconnaissance of the analysis area during spring and summer 2013. Goshawk were observed at several locations, including Units 23 and 99.

### *Neotropical Migratory Birds*

Neotropical migratory birds are those that breed in the U.S. and winter south of the border in Central and South America. Continental and local declines in population trends for migratory and resident landbirds have developed into an international concern. Habitat loss is considered the primary factor in the decline of some of these species. The Umatilla National Forest provides high quality habitat for resident and Neotropical bird species. Over 50% of the 1.4 million acre Forest is managed as wilderness or roadless, providing high quality, well distributed habitats across the forest landscape. According to the 2010 State of the Birds report (North American Bird Conservation Initiative 2010), “Short-term actions [to enhance Neotropical migratory birds] should focus on managing forests to increase resistance to change and promote resilience. Managers can help forests resist climate change by protecting forests with high ecological integrity such as National Forest roadless areas and by improving forest health and reducing undesirable (or extreme) effects of fires, insects, and diseases. We can increase the resilience of forests to accommodate gradual changes by emphasizing process rather than

structure and composition, such as restoring natural fire regimes where possible, and restoring natural hydrology to maintain fragile riparian forests."

Partners in Flight (PIF) led an effort to complete a series of Bird Conservation Plans for the entire continental United States to address declining population trends in migratory landbirds. The Partners in Flight Bird Conservation Plans are used to address the requirements contained in Executive Order (EO) 13186 (January 10, 2001), *Responsibilities of Federal Agencies to Protect Migratory Birds*. Executive Order 13186 states that environmental analysis of Federal actions (through the NEPA) will evaluate the effects of actions and agency plans on migratory birds, and attempt to reduce unintentional take of migratory birds where it is expected to have a negative effect on migratory bird populations. *The Conservation Strategy for Landbirds in the Northern Rocky Mountains of Eastern Oregon and Washington* (Altman 2000) was published by the Oregon-Washington Chapter of Partners in Flight in 2000. The Strategy uses a "priority habitats and focal species" approach. By managing for a group of focal species representative of important habitat components, many other species and elements of biodiversity would be conserved. Table W-31 displays focal species and associated priority habitats from the Altman (2000) publication.

**Table 3-24 Priority habitat features and focal species for habitats in the Northern Rocky Mountain Province as described in Altman (2000).**

| Habitat Type | Habitat Feature/Conservation Focus | Focal Species |
|---|---|---|
| Dry Forest | Large patches of old forest with large trees and snags | White-headed woodpecker |
| | Old forest with large trees & snags interspersed with grassy openings and dense thickets | Flammulated owl |
| | Open understory with regenerating pines | Chipping sparrow |
| | Patches of burned old forest | Lewis' woodpecker |
| Mesic Mixed Conifer | Large snags | Vaux's swift |
| | Overstory canopy closure | Townsend's warbler |
| | Structurally diverse; multi-layered | Varied thrush |
| | Dense shrub layer in the forest understory or forested openings | MacGillivray's warbler |
| | Edges and openings created by wildfire | Olive-sided flycatcher |
| Riparian Woodland | Large snags in riparian woodlands | Lewis' woodpecker |
| | Riparian woodland canopy foliage | Red-eyed vireo |
| | Riparian woodland understory vegetation | Veery |
| Riparian Shrub | Shrub density; willow/alder shrub patches | Willow flycatcher |

| | | |
|---|---|---|
| Unique Habitats | Subalpine | Hermit thrush |
| | Montane Meadow | Upland sandpiper |
| | Steppe-shrubland | Vesper sparrow |
| | Aspen | Red-naped sapsucker |
| | Alpine | Gray-crowned rosy finch |

Habitat types (defined in Altman 2000) present within the analysis area include Dry Forest (equivalent to the dry upland forest PVG), Mesic Mixed Conifer Forest (generally equivalent to the moist upland forest PVG), Aspen, and Steppe-Shrubland. Limited acres of Riparian Shrub habitat are also present along perennial streams within the analysis area.

### *Dry Forest Habitat*

The majority (87%) of the analysis area is made up of dry upland forest habitats. The dry forest habitat type includes coniferous forest composed exclusively of ponderosa pine, or dry stands co-dominated by ponderosa pine and Douglas-fir or grand fir (Altman 2000). Bird species associated with dry forest have shown the greatest population declines and range retractions in the northern Rocky Mountain province (Altman 2000). In particular, bird species highly associated with snags and old-forest conditions have declined. These species include white-headed woodpecker, flammulated owl, white-breasted nuthatch, pygmy nuthatch, Williamson's sapsucker, and Lewis' woodpecker. Old forest, single-story ponderosa pine habitat has declined by 96 percent in the Blue Mountains ERUs (Ecological Reporting Units) of the Interior Columbia Basin, primarily due to timber harvest and fire suppression (Wisdom et al. 2000). Habitat restoration is the primary strategy for conservation of landbirds associated with this habitat type.

The dry upland forest habitat within the analysis area generally meets the dry forest habitat criteria provided by Altman (2000), with the exception of the size and spacing of old forest single-stratum (OFSS) habitat criteria. Old forest single stratum habitat is currently well below the (HRV) in the dry upland PVG in the analysis area. All four of the dry forest focal species listed in the Altman (2000) report are believed to be present in the analysis area, either due to observation records, or assumptions that are based on the presence of potential habitat. The chipping sparrow is common on the District; the other species are uncommon. The Lewis' and white-headed woodpeckers were also analyzed as Sensitive species. Refer to the *Threatened, Endangered, Proposed, Candidate, and Sensitive Species* section for further discussion of these species.

### *Mesic Mixed Conifer Habitat*

Mesic mixed conifer habitats are primarily cool Douglas-fir, grand fir, and larch sites; in some stands, lodgepole pine may also be present. Late successional stages have been commonly harvested with regeneration prescriptions such as clearcutting or shelterwood harvesting to reduce insect and disease damage. Bird species associated with late successional stages have been impacted by the loss of late-seral conditions and snags. The desired condition is a late successional, multi-layered forest with a diversity of structural elements. See Table W-38 for

focal species and key habitat features in the mesic mixed conifer habitat type. Mesic mixed conifer habitat accounts for approximately 1% of the analysis area.

### *Steppe-Shrubland*

Steppe-shrublands occur in a wide range of habitat types, including grassland, sagebrush, montane meadows, fallow fields, juniper-steppe, and dry open woodlands and openings in forested habitats (Altman 2000). Habitat criteria (objectives) for the steppe-shrubland habitat type include maintaining a mosaic of steppe and shrubland habitats with < 10 percent tree cover. Associated bird species include vesper sparrow, lark sparrow, Brewer's sparrow, and long-billed curlew. The majority of grassland habitats in the analysis area meet these objectives. These habitats are scattered throughout the analysis area, with the majority in the lowest elevations where dry grassland habitat is present. Grassland and non-forest habitat occurs on approximately 12% of the analysis area. Shrublands are present in the analysis area. Patches of sage brush, bitterbrush, and mountain mahogany are present in some areas, particularly in the southern portion of the analysis area. Conifers (juniper, ponderosa pine, and in some cases Douglas-fir) have encroached into historic shrubland habitat, reducing the quality, quantity (size), and connectivity of these patches.

### *Aspen*

Aspen stands were once widespread throughout the Blue Mountains, however, a combination of factors including fire suppression, competition with invading shade-tolerant species, overgrazing (livestock and wild ungulates), and drought have contributed to their decline. Associated bird species include the red-naped sapsucker (focal species), Williamson's sapsucker, tree swallow, northern pygmy owl, western screech owl, and others.

Remnant aspen stands are present within the Kahler analysis area. In general, they are small in size (<1 acre), but several larger stands in excess of 5 acres are present. They are generally spatially discontinuous, have a deteriorating overstory, and have little regeneration. There are approximately 40 known aspen stands of varying size in the analysis area. Several of the known stands have been fenced to eliminate domestic and wild ungulate grazing; the majority of these fences are currently in poor condition. There are likely unmapped stands in the analysis area, as well.

## Recreation

**Scale of Analysis**

The scale of analysis is the Kahler project boundary (32,840 acres).

**Methodology and Assumptions**

Geographic Information Systems mapping was used to portray spatial relationships between recreation use areas and activities that could affect the continued use of the area. Effects of harvest on visual quality were also determined using these maps. Areas of concern were then verified on the ground.

**Recreation Opportunity Spectrum**

**Existing Recreation Uses and Conditions**

Each Forest Plan Management Area within the Kahler analysis area is assigned a class under the Recreation Opportunity Spectrum (ROS) (Table 3-19). Each class is defined by the degree

certain recreation experience needs are satisfied. This is based on the extent that the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use.

**Table 3-25 ROS Classes within the Kahler analysis area**

| Management Area | Acres | ROS Class |
|---|---|---|
| A4 - Viewshed 2 (Highway 207) | 901 | Roaded Natural to Roaded Modified |
| A6 – Developed Recreation (Fairview Campground) | 50 | Primarily Roaded Natural with some Rural |
| C1 – Dedicated Old Growth | 1616 | Primitive to Roaded Natural |
| C3 – Big Game Winter Range | 11958 | Roaded Modified |
| C5 – Riparian | 793 | Roaded Natural to Roaded Modified |
| D2 – Research Natural Area | 84-- | None identified |
| E1 – Timber and Forage | 17446 | Roaded Modified |

ROS classes within the Kahler analysis area are defined as follows (Forest Plan GL 32-33):

*Primitive*

Area is characterized by an essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.

*Roaded Natural*

Area is characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

*Roaded Modified*

A considerably modified natural-appearing environment characterizes the area with considerable evidence of the sights and sounds of humans. Such evidence seldom harmonizes with the natural environment. Interaction between users may be low to moderate, but evidence of other users is prevalent. Resource modification and utilization practices are evident and seldom harmonize with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.

*Rural*

Area is characterized by a substantially modified natural environment. Sights and sounds of people are evident. Renewable resource modification and utilization practices enhance specific recreation activities or provide soil and vegetative cover protection.

## Visual Quality

### Existing Condition

There are 901 acres of the project area that occur within Forest Plan designated management area A4 which emphasizes visual quality. These acres occur along the State Highway 207. Visual quality standards for each of the management areas within the Kahler analysis area are listed in Table 3-20.

**Table 3-26 Visual Quality Objectives within the Kahler Planning Area**

| Forest Plan Mgt. Area | Visual Quality Objective | Definition |
|---|---|---|
| A4- Viewshed 2 | Partial Retention in foreground and Modification in middleground | *Partial Retention* – Human activity may dominate the characteristic landscape, but must, at the same time, follow naturally established form, line, color, and texture. It should remain visually subordinate when viewed in foreground. *Modification* – Human activity may dominate the characteristic landscape, but must, at the same time, follow naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground |
| A6 – Developed Recreation | Partial Retention | Refer to definition under A4 |
| C1 – Dedicated Old Growth | Retention | Human activities are not evident to the casual forest visitor. |
| C3 – Big Game Winter Range | Retention to Maximum Modification | Refer to definition under C1 for Retention and E1 for Maximum Modification. . |
| C5 – Riparian | Retention to Modification | Refer to definition under C1 for Retention and A4 for Modification. |
| D2 – Research Natural Area | Retention | Refer to definition under C1. |
| E1 – Timber and Forage | Maximum Modification | *Maximum Modification* – Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background |

## Camping

### Existing Conditions

There is one developed campground (Fairview Campground) within the Kahler project area. Fairview has five campsites, a vault toilet, a potable water fountain, and is one of the access points to the OHV trail system. Occupancy is very low, except during hunting season when occupancy can reach 100 percent. A portion of the campground lies in open forest, while the remainder is densely stocked with trees. This campground lies within the A6 – Developed Recreation management area (see Tables 1 and 2)

There is also a rental cabin adjacent to Tamarack Lookout that allows for overnight use. This cabin consists of one room with a porch, has an occupancy limit of 4 people, and rents for $40 per night. There is also an exterior propane tank, fire ring and picnic table, and separate vault toilet. This rental cabin lies within the E1 – Timber and Forage management area (see Tables 3-19 and 3-20).

Dispersed camping has traditionally been a popular activity in the area, with sites used intermittently during the three-month big game hunting seasons in the fall. A generic description of a dispersed campsite consists of a user-made area that is generally adjacent to a developed road. The site often has a meat pole hanging in the trees, a rock fire ring and a hardened parking/camping surface for one to three families. There are 16 inventoried dispersed campsites within the Kahler planning area. Sites are predominantly located along Forest Roads 2142, 2400, and 2500.

**Table 3-27 Location of inventoried dispersed campsites**

| Road Number | # of dispersed camps |
|---|---|
| 2400 | 4 |
| 2500 | 6 |
| 2500160 | 1 |
| 2142 | 4 |
| 2500100 | 1 |

## Trails and Dispersed Recreation

### Existing Condition

The main use of the analysis area is for big game hunting. The analysis area falls within the Heppner and Fossil Big Game Management Units designated by the Oregon Department of Fish and Wildlife (Kahler Wildlife Report). The hunting season typically begins at the end of August and extends through the end of November. There are a number of other popular dispersed recreation activities in the area:

- ATV riding
- sight seeing
- camping
- food gathering

- firewood collection

There are 13.5 miles of OHV trail within the Kahler analysis area. The trail system was recently established (West End OHV Environmental Analysis, 2009) and is not well known beyond the local area. Most use occurs during the hunting seasons as a means to access hunting locations. Mixed-use travel is allowed on all open roads unless signed as closed under the District's Access and Travel Management Plan. There are no groomed winter trails within the analysis area.

## Wilderness and Inventoried Roadless Areas

There is no congressionally designated Wilderness or Inventoried Roadless Areas located in or near the project area. The nearest Wilderness is the North Fork John Day Wilderness located approximately 40 miles from the project area. The nearest IRA is the Skookum IRA located approximately 9.5 miles from the project area. Due to their distances from the project area the proposed project would have no direct, indirect or cumulative effects on designated Wilderness or IRA areas.

# Proposed Wilderness Areas

### Introduction

This section of the report discloses the affected environment and environmental consequences for potential wilderness areas (PWAs); and remaining other undeveloped lands. This resource topic has a complicated set of terminology. The following paragraphs of this section are included to help the reader understand the context of this analysis. Appendix A of this report discloses additional narrative and maps in support of this topic.

The USDA Forest Service, Pacific Northwest Region (Region 6) covers approximately 27.2 million acres within the states of Oregon and Washington. This represents approximately 27% of the total acreage of both states combined. These 27.2 million acres are allocated and managed based on the land allocations designated within the respective National Forest Land and Resource Management Plan. However, two types of land designations are overriding and common among all units within the region (indeed the nation), these are the management of Wilderness areas and the management of Inventoried Roadless Area. In Region 6, there are approximately 4 million acres of Inventoried Roadless Areas (15%) and approximately 5 million acres of Wilderness (18%).

The Umatilla National Forest (NF) is one of 16 administrative units that manage National Forest System Lands within the Pacific Northwest Region. The Umatilla NF covers approximately 1.4 million acres and is situated in the northeastern corner of Oregon and southeastern corner of Washington. The Umatilla National Forest contains 303,000 acres of wilderness (21%) and 282,000 acres of Inventoried Roadless Areas (20%). The Forest consists of four Ranger Districts one of which is the Heppner Ranger District.

The Heppner Ranger District is about 212,213 acres in size and contains no Wilderness (0%) and 19,908 acres of Inventoried Roadless Areas (9.3% of District). The Kahler project planning area occurs in the northwestern portion of the Heppner District. The site specific analysis for the Kahler project identified an additional 9,931 acres of lands that had no history of development and were subsequently classified using the criteria discussed later in this section.

**Table 3-28 Contextual Display of Wilderness and Roadless Areas in PNW Region, Umatilla NF, Heppner RD and Kahler project planning area**

| Unit | Acres | Percentage |
|---|---|---|
| **Pacific Northwest Region** | 27.2 million | 27%[1] |
| Wilderness | 5 million | 18% |
| Inventoried Roadless Area | 4 million | 15% |
| **Umatilla National Forest** | 1.4 million | 5%[2] |
| Wilderness | 303,000 | 21% |
| Inventoried Roadless Area | 282,000 | 20% |
| **Heppner Ranger District** | 212,213 | 15%[3] |
| Wilderness | 0 | 0% |
| Inventoried Roadless Area | 19,908 | 9.3% |
| **Kahler Project Planning Area** | 32,840 | 15.5%[4] |
| Wilderness | 0 | 0% |
| Inventoried Roadless Area | 0 | 0% |
| Other lands that have undeveloped character | 9,931[5] | 30.2% |

**[1] Portion (acres) of both Oregon and Washington that are National Forest System lands.**

**[2] Portion (acres) of US Forest Service Pacific Northwest Region that is managed by Umatilla National Forest.**

**[3] Portion (acres) of Umatilla National Forest that is managed by the Heppner Ranger District**

**[4] Portion (acres) of the Heppner Ranger District that occurs within the boundary of the Kahler project area.**

**[5] This number reflects the inventory of other undeveloped lands.**

During public involvement for this project, and in past similar projects, a wide range of terms have been used by respondents, the courts, and the Forest Service when referring to these topics such as roadless, unroaded, uninventoried roadless, undeveloped areas, and roadless expanse.

From the mid-1970s through 2001 the Forest Service maintained a roadless area inventory of undeveloped lands that we used and updated for RARE, RARE II, and in support of Land and Resource Management Planning completed in 1990 for Umatilla National Forest. All during that time we called these polygons “roadless areas” or “inventoried roadless areas” (IRAs). With completion of the Roadless Area Conservation Rule (RACR) in 2001 these lands ceased being just an inventory, and IRAs became more of a designation, with fixed boundaries and prohibitions set by Forest Service regulation (36 CFR 294). Confusion ensued because two

Forest Service maps used the same name; IRA. One map had fixed boundaries set by the RACR and another map had changeable boundaries based on inventory criteria.

To address this situation, the Forest Service created a new term for their inventory of undeveloped lands called "potential wilderness areas" (PWAs) to make a clear distinction between the IRA term used by the 2001 RACR. This terminology addition was made policy by changing the 2006 handbook for wilderness evaluation (FSH 1909.12, Chapter 70) and is also reflected in the 2008 Forest Service NEPA regulations (36 CFR 220). In the regulations, potential effects to "inventoried roadless areas" and "potential wilderness areas" are factors in determining whether a CE, EA, or EIS is the appropriate NEPA document for a particular project. The term "other undeveloped lands" is presented and used in this document to provide a consideration for the balance of those remaining lands that did not meet the inventory criteria for a PWA, were not designated an IRA under the RACR, and do not contain roads and evidence of timber harvest (see definitions below).

To resolve this confusion the Forest Service uses its discretion to rely on agency policy, agency definitions of terms, and agency procedures for the inventory of resources and facilities. Inventory criteria and procedures for potential wilderness areas are found in Forest Service Handbook 1909.12, Chapter 71.

The terms and definitions as stated below will be used in this site-specific analysis. The four resource topics are based on current law, regulation, agency policy, and Umatilla Land and Resource Management Plan (Forest Plan), as amended

1. **Wilderness:** A wilderness area is designated by congressional action under the Wilderness Act of 1964 and other wilderness acts. Wilderness is undeveloped Federal land retaining primeval character and influence without permanent improvements or human habitation (Umatilla Forest Plan, page GL-45).

2. **Inventoried Roadless Areas (IRA)**: These areas were identified in the 2001 Roadless Area Conservation Rule in a set of inventoried roadless area maps, contained in Forest Service Roadless Area Conservation Final Environmental Impact Statement, Volume 2, dated November 2000, which are held at the National headquarters office of the Forest Service, or any subsequent update or revision of those maps (36 CFR 294.11). These areas were set aside through administrative rulemaking and have provisions, within the context of multiple use management, for the protection of IRAs. Most IRA boundaries are substantially identical to those identified as "Roadless Areas" referred to in the 1982 planning rule (36 CFR 219.17) and identified by the Forest Plan, FEIS, Appendix C; however some localized, minor differences in boundaries may exist.

All roadless area acres were allocated to various management area strategies as disclosed in the Umatilla Forest Plan FEIS, Appendix C and described in the Record of Decision (page 6-9) for the FEIS. Some management area strategies were intended to retain the undeveloped roadless character of the roadless area and some management area strategies were intended to develop the lands with timber harvest and road building activities; thus forgoing roadless character.

3. **Potential Wilderness Area (PWA)**: Areas identified using potential wilderness inventory procedures found in Forest Service Handbook (FSH) 1909.12, Chapter 71 are called potential wilderness areas. The inventory is conducted by the Forest Service with the purpose of identifying potential wilderness areas in the National Forest System. The National Forest System Land and Resource Management Planning Rule (currently the

1982 Rule, 36 CFR §219.17) directs that roadless areas be evaluated and considered for wilderness recommendation during the forest planning process.

Potential wilderness areas (PWAs) are not a land designation decision, they do not imply or impart any particular level of management direction or protection, they are not an evaluation of potential wilderness (FSH 1909.12,Chapter 72), and lastly, they are not preliminary administrative recommendations for wilderness designation (FSH 1909.12, Chapter 73). The inventory of PWAs does not change the administrative boundary of any inventoried roadless area (IRA) or any congressionally designated wilderness.

Typically, PWAs substantially overlap, and/or are contiguous with inventoried roadless areas. PWAs may also be contiguous with designated wilderness. Some newly inventoried PWAs may be stand-alone areas that were not identified as "roadless areas" in Appendix C of the 1990 Umatilla Forest Plan and "inventoried roadless areas" as identified in a set of maps in the 2001 RACR. PWAs overlap inventoried roadless areas only where those acres of land are consistent with the inventory criteria (FSH 1909.12, Chapter 71) and may extend beyond IRA and wilderness boundaries consistent with inventory criteria.

4. **Other undeveloped lands**: These acres of land have no history of harvest activity, do not contain forest roads[2] and are not designated as a wilderness area or inventoried as a potential wilderness area.

Appendix A of the Recreation Executive Summary and Report describes the methodology and rationale used to inventory and identify PWAs within the 32,840 acre Kahler project planning area. Maps included in Appendix A (maps A-2 to A-5) show a visual progression of the inventory process, final results, and proposed project activity, if any, that would occur in these areas.

The effects to wilderness, inventoried roadless areas (IRAs), potential wilderness areas (PWAs), and other undeveloped lands were based on maps created using agency inventory procedures (Appendix A of the Recreation Executive Summary and Report) and are considered and disclosed below.

**Scale of Analysis**

The scale of analysis is the 32,840 acre Kahler project planning area. The scale of the analysis area is appropriate because the project planning area is bounded by roads, past harvest activity and private land (see maps in Appendix A).

**Indicators for comparison between alternatives are:**

- *Roadless characteristics* (features that are often present in and characterize inventoried roadless areas) as identified in the 2001 Roadless Area Conservation Rule (36 CFR §294.11)
    - High quality or undisturbed soil, water, and air

[2] **Forest road** – A road wholly or partly within or adjacent to and serving the National Forest System that the Forest Service determines is necessary for the protection, administration, and utilization of the National Forest System and the use and development of its resources. Road – A motor vehicle route over 50 inches wide, unless identified and managed as a trail (36CFR §212.1)

- Sources of public drinking water
- Diversity of plant and animal communities
- Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land
- Primitive, semi-primitive, non-motorized and semi-primitive motorized classes of dispersed recreation
- Reference landscapes
- Natural appearing landscapes with high scenic quality
- Traditional cultural properties and sacred sites and
- Other locally identified unique characteristics

**Affected Environment**

The table below is a summary of all the acres evaluated in the PWA inventory process for this project. Information summarized for this table can be found in Appendix A of the Recreation Report, Tables A-1, A-2 and A-3. Maps A-1, A-2, A-3, A-4 and A-5 are a visual representation of this inventory process.

**Table 3-29 Potential Wilderness Area Inventory Summary**

| | **Approximate Acres Kahler Project Planning Area** |
|---|---|
| Map A-1; Total Acres Inventoried. | 32,840 |
| Map A-2; Acres Removed from inventory due to past harvest. | 25,054 |
| Map A-3; Acres removed from inventory due to activities related to roads | 11,540* |
| Map A-4; Resulting lands that remain after past harvest and activities related to roads are removed from inventory. (undeveloped lands) | 9,931** |
| Map A-5; Acres of Potential Wilderness Areas | 0 |
| Acres of undeveloped lands that did not meet PWA inventory criteria at FSH 1909.12 Chapter 71.1 (other undeveloped lands) | 9,931** |

*** Most of these acres overlap with acres of past harvest.**

**** This number does not include polygons less than one acre in size.**

# Other Undeveloped Lands

## Background

An outcome of the PWA inventory process was the identification of polygons of other undeveloped lands (Table A-2 in the Recreation Executive Summary and Report, Appendix A). These polygons did not meet inventory criteria as PWAs and they are not inventoried roadless areas or a designated wilderness area. Each individual polygon of land has no history of harvest activity and does not contain forest roads. They are stand-alone polygons of varying acreages all less than 4,999 acres within the project planning area. All polygons less than one (1) acre were considered in the inventory process but dropped from detailed study because individual polygons this small cannot be preserved due to physical terrain and natural conditions and they do not have self-contained ecosystems, such as an island. Detailed information regarding the inventory process and methodology used for the Kahler project analysis, along with maps and tables is located in Appendix A of this document.

There are no forest-wide or management area standards specific to other undeveloped lands in the Umatilla Forest Plan. All lands, including undeveloped lands, are managed consistent with forest-wide standards and guidelines and by designated Forest Plan management area allocations.

**Scale of Analysis**

The scale of analysis is represented by the Kahler project planning area. Other undeveloped lands have intrinsic ecological and social values because they do not contain roads and evidence of past timber harvest. These values are used as indicators of comparison to display effects between alternatives. Values and features that often characterize an inventoried roadless area (36 CRF 294) were specifically avoided as indicators of comparison to reduce confusion as described in the Introduction and Background. That is, other undeveloped lands are not inventoried roadless areas or potential wilderness areas and therefore are described using different indicators of comparison.

**Indicators of comparison between alternatives are:**

- Intrinsic physical and biological resources (soils, water, wildlife, fisheries, etc.)
- Intrinsic social values (apparent naturalness, solitude, remoteness)
- Change in acres of other undeveloped lands

**Affected Environment**

Table 3-30 displays the acres of other undeveloped lands within the Kahler project planning area along with references to maps in Appendix A for a visual representation. In the 32,840 acre Kahler project planning area, approximately 9,931 acres (about 30.2 percent of the project planning area) have been identified as isolated polygons of other undeveloped lands that area at least one acre in size. No acres have been identified as potential wilderness areas (PWA), and the remaining 22,917 acres (about 69.8 percent) are developed and managed (contain evidence of past harvest and forest roads). Individual polygons of other undeveloped lands less than an acre were eliminated from further study because no special or unique resource values were

identified and the description of effects to individual pieces of land less than one acre are better disclosed as part of the other resource effects section in this EIS.

**Table 3-30 Potential Wilderness Area Inventory Map by Map Description**

| | Approximate Acres Kahler Project Planning Area |
|---|---|
| Map 1 Total Acres Inventoried. | 32,840 |
| Map 2 Acres Removed from inventory due to past harvest. | 25,054 |
| Map 3 Acres removed from inventory due to activities related to roads | 11,540* |
| Map 4 Resulting lands that remain after past harvest and activities related to roads are removed from inventory. (undeveloped lands) | 9,931** |
| Map 5 Acres of Potential Wilderness Areas | 0** |
| Acres of undeveloped lands that did not meet PWA inventory criteria at FSH 1909.12 Chapter 71.1 (other undeveloped lands) | 9,931** |
| * Most of these acres overlap with acres of past harvest.<br>** This number does not include polygons less than one acre in size. | |

Table 3-25 displays the number, size class, and approximate acres of other undeveloped lands represented. For perspective, one square mile is about 640 acres. The residual shape of each undeveloped polygon is the result of boundaries created by past harvest and road building or natural openings.

**Table 3-31 Size Class and Acres of Other Undeveloped Lands in the Kahler Planning Area**

| Number of Polygons | Size Class | Approximate Acres |
|---|---|---|
| 49 | 1 to 99 acres | 938.6 |
| 7 | 100 to 499 acres | 1799.3 |
| 1 | 500 to 999 acres | 567.2 |
| 4 | 1,000 to 4,999 acres | 6,626.1 |
| 0 | 5,000+ acres | 0 |
| **61** | **Total** | **9,931.2** |

Other undeveloped lands include soils, water, fish and wildlife habitat etc. that have not been impacted directly by past harvest and road building. The current condition of soil; water quality; air quality; plant and animal communities; habitat for threatened, endangered, and sensitive species; noxious weeds; recreation; and cultural resources within the project planning area, including other undeveloped lands are described in other resource reports associated with the Kahler project.

No special or unique values in other undeveloped lands have been identified by project resource specialists in their environmental analysis for the implementation of any alternative analyzed in detail.

Human influences have had limited impact to long-term ecological processes within the other undeveloped lands. Disturbance by insects and fire has been and most likely will continue to be the factors with the most potential to impact the area. Opportunities for primitive recreation are limited to gathering of wild foods, hiking, hunting and dispersed camping. Ongoing firewood collection and removal of danger trees along forest roads that border each polygon changes the vegetation, leaves stumps, and presents a managed appearance within a developed transportation corridor.

Opportunities for a feeling of solitude, the spirit of adventure and awareness, serenity, and self-reliance are limited by the size and shape of polygons. Distance and topographic screening are also factors. Nearby, non-conforming sights and sounds of roads and timber harvest can be heard and often seen from within the other undeveloped lands.

The existing condition of all remaining 22,917 acres of land within and affected by the Kahler project presents a landscape that has been managed and is generally developed in nature; these lands contain evidence of past harvest and forest roads. Past management actions and current conditions reflect the multiple-use intent and decisions made in the Forest Plan (1990 as amended), and reflects consistency with Forest Plan management area allocations.

# Economic Activity

This section incorporates by reference the Kahler Dry Forest Restoration Project Economics Report contained in the project analysis file at the Heppner Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

## Scope of Analysis

The direct revenue and costs are identified for each alternative measuring the value of wood products to determine the estimated value of each alternative and viability of the Kahler Project with the alternatives identified. While there are other economic values in terms of revenues and costs that will be created from the implementation of this project to wildlife (terrestrial, aquatic), recreation, roads, soil, water and vegetation, the values are intangible and subject to individual personal judgment. Therefore given the inability to determine each person's values for each resource respective of the alternatives those values are unavailable and cannot be used.
This section deals with the economic viability of the Kahler Project area timber sales. Economic viability is dependent on costs and revenues associated with a particular timber sale. Timber sales, non-commercial thinning, fuel treatments, and associated resource work can generate employment and stimulate the local economy.
Other environmental factors such as water quality, fish, wildlife, productivity, have value that can be expressed in economic or non-economic terms. However, these other environmental factors do not have financial benefits and cost that are identifiable and quantifiable with relationship to the activities proposed for the Kahler Project. Therefore, an analysis would not show any financial or economic difference in those factors between alternatives. Therefore, economic analysis of those other environmental factors will not be included in this report.

## Current Condition

The affected area, or economic impact zone, for the Umatilla National Forest consists of Grant, Morrow, Umatilla, Union, Wallowa, and Wheeler counties in Oregon. The Kahler Project includes Wheeler and Grant counties in Oregon. Economic profiles have been developed for Wheeler and Grant counties and are available at the Heppner Ranger district. The profiles summarize demographic, employment, and income trends in those counties. Refer to the Umatilla National Forest, land and Resource Management Plan, Final Environmental Impact Statement, Appendix B, for additional detail description of the main social and economic characteristics of the area (USDA 1990).